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MEDICAL GROUP PRACTICE IN THE UNITED STATES*

II. Survey of Five Groups in New England and the Middle Atlantic States

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THIS is the second of a series of reports on the purposes and findings of a study of medical group practice conducted by the United States Public Health Service.

During the first eight months of 1946, technics for the study of group-practice units were worked out and tested in studies of five groups in New England and the Middle Atlantic states. The general method of study, outlined in the first paper of this series,[1] involves approaches by two technics: an intensive interview survey of the physicians and key administrative personnel of the group, and a statistical analysis of a random sample of the group's medical records. The present paper is concerned only with the development, application and results of the interview survey. Studies are being continued in other parts of the country, and will be the subject of future reports.

Method of Study

For the study of the first group, comprehensive interview outlines were worked out to obtain detailed information about the group's professional and administrative practices, facilities and personnel, including biographical data on the individual members, and to carry out an opinion survey of the physicians. Interview outlines previously used by Roberts[2] were rearranged and amplified to form the basis of the schedules dealing with the practices of the group as a whole. After the first study, the schedules were revised somewhat and were used for two other groups. Further revision was then found to be necessary, and the resulting schedules were employed with the last two groups. No other major revisions are contemplated for the duration of this study. In the present report, comparable data for all five groups have been used, unless a specific note to the contrary has been made.

The study can of course be conducted only with the full permission and co-operation of the group being studied. The interview survey is carried out by an analyst familiar with medical practices, who spends two or three weeks with each group. Information regarding administrative and fiscal practices, personnel and facilities are obtained by the analyst from the principal medical and nonmedical administrators of the group. An effort is made to interview each physician and to obtain his opinions on group practice, as well as details of his training and experience.

Because of the lack of factual knowledge about groups and group practice generally, the interview outlines go into considerable detail concerning all aspects of the personnel, organization and practices of groups, consideration of the incomes of individual physicians alone being omitted. It is hoped that by analysis of this mass of detailed information, the common patterns and the variations of organization and practices may be determined.

The data given below, which were selected from the available material either on the basis of known or assumed intrinsic importance or on that of variation among the five groups studied, are primarily presented as illustrations of the kind of information sought in the study and are not necessarily indicative of the nature of group practice in general. The findings are discussed under the following headings: organization, facilities, scope and type of services, professional standards, financial arrangements, volume of work in 1945 and opinion.

Organization

The great majority of medical groups in the United States are private partnerships, but there are also substantial numbers of hospital groups, industrial groups and consumer-sponsored groups. The classes considered in this report fall into three of these four categories. No consumer-sponsored group was studied in the New England and Middle Atlantic States. Two of the groups are private partnerships, two are hospital groups, with ownership and authority vested in a nonprofit community hospital, and one is an industrial group, with ownership and authority vested in an industrial company. In the last group, the employees and their

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dependents make up the total patient load. All five groups have existed for many years, the period of existence as groups ranging from seventeen to thirty years.

Facilities

The study schedules go into detail about the physical facilities, equipment and hospitals used by each group, but in view of the small number of groups in this series, discussion is limited to a brief consideration of the offices and hospital facilities.

Offices. Each of the two hospital groups has its offices in the hospital building. One of the partnership groups owns its building, and the other has transferred its clinic-building title to the hospital with which it is integrally affiliated. The industrial group uses two main buildings and two annexes, all owned by the company and located in the adjacent cities in which the company has its plants.

Hospital facilities. The members of the hospital groups make up the complete staffs of their respective hospitals. Of the two private partnership groups, one is integrally affiliated with a hospital and comprises its complete staff, whereas members of the other group are on the staff of a local community hospital but do not control its professional policies. The industrial group is closely associated with a community hospital with which all its full-time members have staff affiliations; the group controls to a large extent the professional policies of the hospital.

The hospitals range in size from 95 to 374 beds. All the hospitals are registered with the American Medical Association, and all are approved by the American College of Surgeons. Four of the five are approved for intern and resident training by the American Medical Association.

Scope and Type of Services

The scope and type of services offered by a group are related to its size, the fields of medicine covered by its staff, the variety of ancillary services furnished, the medical requirements of the group's clientele and, possibly most important, the orientation of the group toward either general medical care or specialized work for referred patients.

Primary Activity

A classification of medical groups according to the type of medical services offered was presented in the introductory paper.[1] A service group is one in which the principal activity is the furnishing of complete medical care to a continuing clientele, whereas a reference group primarily furnishes specialized care to patients referred to them by outside physicians, usually for a single episode of illness. According to this classification, three of the present groups (one private, one hospital and one industrial) are service groups, and two (one private and one hospital) are reference groups. It was noted in the previous paper that this classification is not absolute, but merely serves to define the principal function of the group. A mixture of activity was found in all the present groups except the industrial group, which is purely service in type. The other two service groups, especially the hospital service group, do a certain amount of referred work, and the two reference groups furnish a certain amount of general medical care. It may be pointed out again that a service group may be composed entirely of specialists. The distinction between service and reference groups is based on a determination of whether the group *as a group* is primarily acting as a "general practitioner" or as a "specialist."

Size of Groups and Fields of Medicine Covered

The five groups range in size from 15 to 46 members and are therefore larger than most groups in the United States.* Of the 122 members, 24 per cent are on a part-time basis. More than four fifths of these are in the industrial group. (Over half the membership of this group is part-time; it should be noted that the group classifies a number of men as part-time because they have the privilege of evening private practice, although they actually put in a full day's work with the group.) In the two groups providing psychiatric services, the psychiatrist is a part-time member. These figures, as well as the fields of medical practice covered by each group and the number of physicians in each field, are summarized in Table 1.

In addition to the medical services noted, all the groups provide physiotherapy, and all have clinical laboratories, although the clinical laboratories in one group are operated by the associated hospital and directed by a pathologist who is not a member of the group. Ambulance service is furnished directly only by the two hospital groups. One reference group offers oral surgery, and the industrial group provides general dentistry, including orthodontia. All the groups except one private service group have pharmacies. Only the industrial group affords specific social service.

All but one of the groups provide office, home and hospital care. The one exception, a hospital reference group, does not make home calls.

The two hospital groups have no evening or Sunday office hours for outpatients. The industrial group holds clinic hours between 8:00 a.m. and 6:00 p.m., six days a week. Both private groups have evening office hours, until 8 o'clock in one and until 9 in the other, and patients are also seen on Sunday by these two groups — regularly by one group and occasionally by the other.

An appointment schedule is rather closely adhered to in three of the groups. One of the hospital groups

*According to the report of the American Medical Association[2] in 1940, only 5.4 per cent of groups in the United States had 15 or more physician members in 1939. A questionnaire survey conducted by the Division of Public Health Methods in the summer of 1946, a report of which is in preparation, showed that about 10 per cent of the groups now have 15 or more full-time physician members.

does not follow an appointment schedule closely, and the industrial group makes appointments only for patients seeing specialists.

Communities Served

The four nonindustrial groups are located in comparatively small communities — three in places of 7000 population or less, and the other in a town of 16,000. The two reference groups draw most of their patients from within a radius of about 50 miles and thus serve estimated populations of 88,000 and 350,000 respectively. The two nonindustrial service groups draw patients from estimated populations of 65,000 and 87,000, respectively, whereas the industrial service group cares for about 50,000 employees and dependents, living in three contiguous cities and adjacent towns.

The two hospital groups, one reference and one service, both care for predominantly rural populations. The area served by one of the partnership groups (reference) is largely rural in character, and that of the other partnership group (service) is mainly urban and suburban. The clientele of each of the four nonindustrial groups is said to be representative of the population of the area served.

Professional Standards

One of the obviously important questions about group practice is the professional caliber of the participating physicians. This is not susceptible of accurate measurement or of comparison with the caliber of individual practitioners, but a number of criteria have been used in an effort to throw some light on the situation. These include the age, training and experience of individual members of groups, membership in a county medical society and certification of specialists by American specialty boards and membership in recognized specialist societies. Concerning the group as a whole, consideration was given to the kind and amount of professional supervision, medical staff meetings, responsibility for patients, system of medical records employed, qualifications required of new members and requirements for postgraduate study.

Age and Years in Medical Practice

Of the 109 physicians about whom data were available, the average is forty-two and a half years of age, 41 per cent being under forty years of age. Physicians in the service groups are about four years older on the average than those in the reference groups; the mean ages of the men in the hospital, partnership and industrial groups are forty-four and a half, forty-one and seven-tenths and forty-four years, respectively.

The total period of internship and residency, as well as the years in medical practice and the types of practice engaged in, is summarized in Table 2. Only physicians for whom complete information was available in these respects are included in the tabulation.

The average number of years since graduation from medical school is almost identical with Rorem's[4] finding of an average of sixteen years since graduation for 415 physicians in 46 clinics.

Table 1. *Distribution of Members in Five Medical Groups according to Specialty.*

Group	Total Members	Part-Time Members	Medicine							Surgery							Eye, Ear, Nose and Throat				Obstetrics and Gynecology			Other Specialists					
			Total	General	Internal	Dermatology	Psychiatry	Allergy	Industrial	Total	General	Urology	Orthopedic	Thoracic	Plastic	Neurologic	Total	Combined	Eye	Ear, Nose and Throat	Total	Combined	Obstetrics	Pediatrics	Radiology	Anesthesiology	Pathology	Dentistry	Biochemistry
A	18	—	2	—	2	—	—	—	—	6	4	1	1	—	—	—	3	—	1	2	2	1	1	1	1	1	1	1	—
B	23	1	7	—	6	—	1*	—	—	7	1	2	1	1	1	1	2	—	1	1	2	1	1	2	2	1	—†	—	—
C	20	3	6	—	4	1	1*	—	—	5	4	1*	—	—	—	—	3	—	2*	1	2	2	—	2	1‡	1	—	—	—
D	46	24	19	14§	2	1*	—	1*	1	7	5¶	1*	—	1*	—	—	4	1*	1*	2*	3	1*	2*	2*	1*	1	2‖	7	—
E	15	1	5	—	5	—	—	—	—	2	2	—	—	—	—	—	2	—	1*	1	1	1	—	2	1	—	—	1	1
Total	122	—	39	14	19	2	2	1	1	27	16	5	2	2	1	1	14	1	6	7	10	6	4	9	6	4	4	8	1‡
Part time	—	29	12	8	—	1	2	1	—	6	3	2	—	1	—	—	5	1	3	1	2	1	1	1	1	—	2	—	—

*One part-time member.
†Laboratories are in the associated hospital and are directed by a pathologist who is not a member of the group.
‡Not a doctor of medicine.
§Eight part-time members.
¶Three part-time members.
‖Two part-time members.

The total hospital training, including internships, residencies and fellowships, averages three and a half years for full-time and two years and ten months for part-time physicians. The physicians in the reference groups average about five months more hospital training than those in the service groups. Considering full-time members by type of organization, the private partnership physicians have the highest average period of hospital training (four years and two months), followed by the hospital groups (three and a half years) and the industrial group (two years and one month). The comparatively low figure of the industrial group is presumably explained by the large number of general practitioners on its staff, and this circumstance also largely accounts for the difference between reference and service groups in the total extent of hospital training. The physicians under forty averaged about five months more hospital training than those over forty.

Of the twelve years spent in medical practice by the 77 full-time physicians, virtually three fourths was spent in group practice, almost entirely with the present groups. Only 5 men, or 6 per cent of the total, had practiced with a group other than the present one. Seventeen, or 22 per cent of the total, had previously been in individual practice for an average of three years and ten months. It is of interest that 14 of the 29 physicians in the hospital groups reported institutional experience, averaging almost four years, which in a sense may be considered experience in group practice.

Membership in County Medical Society

All the physicians in the five groups, except a few who had recently returned from the armed forces, were members of county medical societies.

Specialization

The whole question of specialization is closely related to one of the basic problems of group practice—that is, whether groups can efficiently undertake to furnish complete medical care to a continuing clientele, or whether they should reserve their services almost exclusively for the care of serious or complicated illnesses that are beyond the capabilities of the well trained general practitioner. In the latter case (reference groups), it seems obvious that the group structure would have no place for general practitioners but would be made up entirely of specialists. Such groups may, however, provide each patient with a "personal physician," who is primarily responsible for the whole course of diagnosis and treatment and who co-ordinates and explains to the patient the findings and recommendations of the other specialists.

The problem presented by the service groups is somewhat more complex. Should such groups be composed entirely of specialists, or is there a place in them for general practitioners? If general practitioners are to be included, should they be young men planning to specialize, or should they be men making a career of general practice? Furthermore, what should be the functions of a general practitioner within a group? Should he eschew all but

TABLE 2. *Mean Years Spent in Hospital Training and in Various Types of Practice by 100 Physicians in Five Medical Groups, by Type of Group and by Age.*

Education and Experience	Total Physicians		Service Group		Reference Group		Partnership Organization		Hospital Organization		Industrial Organization		Physicians under Forty Years of Age		Physicians Forty Years of Age and Over	
	No.	Mean Interval	No.	Mean Interval	No.	Mean Interval	No.	Mean Interval	No.	Mean Interval	No.	Mean Interval	No.	Mean Interval	No.	Mean Interval
		yr.		yr.		yr.		yr.		yr.		yr.		yr.		yr.
Graduation from medical school:																
Full time	77	15.7	40	16.8	37	14.5	35	14.5	29	15.7	13	18.9	34	9.3	43	20.6
Part time	23	16.0	22	15.9	1	17.8	3	18.3	0	0	20	15.6	9	9.9	14	19.8
Internship and residency:																
Full time	77	3.6	40	3.4	37	3.8	35	4.2	29	3.6	13	2.1	34	3.8	43	3.4
Part time	23	2.8	22	2.8	1	2.8	3	2.9	0	0	20	2.8	9	2.8	14	2.8
Various types of practice:																
Present group:																
Full time	77	8.7	40	9.3	37	8.1	35	7.8	29	8.6	13	11.4	34	3.1	43	13.2
Part time	23	6.3	22	6.2	1	9.0	3	7.0	0	0	20	6.2	9	3.2	14	8.3
Other groups:																
Full time	5	2.6	3	3.7	2	1.0	1	8.0	3	1.0	1	2.0	1	1.0	4	3.0
Solo practice:																
Full time	17	3.8	10	4.3	7	3.0	6	2.2	5	3.0	6	6.0	4	3.0	13	4.0
Military service:																
Full time	32	3.3	23	3.4	9	3.1	16	3.1	8	3.6	8	3.5	14	3.8	18	3.0
Part time	7	3.7	7	3.7	0	0.0	0	0.0	0	0.0	7	3.7	6	3.7	1	4.0
Institutional work*																
Full time	20	3.7	9	3.3	11	4.0	5	3.2	14	3.9	1	4.0	6	1.8	14	4.5
Part time	3	6.3	2	6.5	1	6.0	1	6.0	0	0.0	2	6.5	0	0.0	3	6.3

*Refers to medical schools, hospitals, special institutions and so forth.

the simplest work in any of the various specialties, becoming essentially an uncertified internist, or should he develop interest and skill in one or more specialties, becoming a partial specialist in surgery or obstetrics or some other field, with general practice as his secondary interest? These wide variations in the functions of a general practitioner, which are confusing enough in individual practice, become doubly so when an attempt is made to evaluate the place of the general practitioner in group practice.

At least four concepts are included under the term "general practitioner" as it is commonly employed, and it is important that the term be defined with sufficient accuracy for the reader to determine which concept is meant. These four concepts can be described as follows:

The physician who limits his practice to the field of internal medicine, who considers the patient as a whole individual, but who does not attempt to do any work in surgery, obstetrics or other specialized fields. As noted above, this type of "general practitioner" is essentially an uncertified internist.

The physician who treats the patient as a whole individual and who, in addition to covering the general field of internal medicine, undertakes work in surgery, obstetrics and other fields, within the limits of his training, skill, self-assurance and hospital facilities. This concept is probably most frequently in mind when the unqualified terms "general practitioner" and "old family physician" are used. It is also the kind of general practitioner who seems to be most out of place in group practice, which is usually regarded as a way of escape from the impossible task of trying to know everything about all fields of medicine.

The physician who does some work in the general field of internal medicine, who treats the patient as a whole individual but who has also developed interest and skill in an outside specialty, such as surgery. He therefore becomes a partial (often, eventually, a complete) specialist, paying less and less attention to general practice.

The physician who develops an intimate knowledge of his patients, treating them as whole individuals, but who does not attempt to treat them for any illness that falls outside his own field. This is essentially the concept of "personal physician," and can really be applied to specialists as well as to general practitioners. An eminent internist, certified in internal medicine and in gastroenterology, recently stated that he was a "general practitioner." Further discussion showed that he was using this fourth concept, and when the other concepts were outlined, he said: "That sort of thing has no place in the future practice of medicine."

Precision in terminology is desirable, although probably not attainable at this late date, but an effort will be made in these reports to indicate which concept of the general practitioner is being discussed. The concepts described above may be indicated as follows: general practitioner (uncertified internist); general practitioner (multiple field); partial specialist; and personal physician — it should again be noted that a "personal physician" may be a specialist, an internist or even a full-time practitioner of one of the surgical specialties; he may think of, and treat, the patient as a whole individual and still refer the patient to someone else for the diagnosis and treatment of illnesses that fall outside his own specialty.

All four of the nonindustrial groups included in the present report have apparently decided that their organizations have no place for general practitioners of any description; all the physicians in these groups claim to be specialists and state that they limit their practice to their specialties. The industrial group contains 14 general practitioners, who seem in general to fall into the category of "uncertified internist." Of the 103 physicians in all five groups about whom information is available, therefore, 86 per cent limit their practice to one field of medicine (Table 3).

Of the 89 physicians who claim to be specialists, 57.3 per cent are certified by American specialty boards. Fifteen of the nonaccredited specialists are members of specialist societies, so that 74.2 per cent of the specialists are either certified or are members of specialist societies. There is no appreciable difference in this respect between the service and the reference groups.

The specialists in the hospital groups have the highest percentage of certification — 66.7 per cent. The figure for the private partnership groups is 57.5 per cent, and that for the industrial group 42.1 per cent.

The specialists forty years of age and over have a higher percentage of certification than those under forty, but it may be noted that all the uncertified specialists under forty about whom information is available have applied for certification, whereas only 17 per cent of the uncertified specialists over forty have applied.

The three hospitals of which the groups form the complete staffs have authority to train physicians for one or more specialty boards.

Professional Supervision

It seems obvious that if a medical group is to continue functioning as an organized entity, some degree of professional supervision must be necessary, but only three of the groups reported that there was any direct supervision, even of the younger members. The director of one of the other groups believed that sufficient supervision of the members was attained at staff meetings during discussion of case reports,

whereas the fifth reported that there was no official attempt at supervision. In the opinion survey, 74 per cent of 84 physicians considered professional supervision, direct or indirect, to be desirable, whereas only 46 per cent of these physicians believed that there was any supervision of their own practice.

No special correlation between age and attitude is evident in this question of professional supervision, nor is there any marked distinction between service and reference groups.

Medical Staff Meetings

Staff meetings of the whole group are held regularly in each of the five groups. The frequency of these meetings varies from once a week to once a month. Case reports are common to all such meetings; death reports are considered by four of the groups, and special reports by staff members and a journal club are parts of the programs in two.

Responsibility for Patients

In all but one of the groups — a hospital service group — the patient is primarily the responsibility of a single physician during a given episode of illness. In that group there is, in general, departmental rather than individual responsibility.

In the groups in which the patient is primarily the responsibility of a single physician, selection is usually made by the patient, although a referring physician outside the group may, in two groups, request the services of a particular physician. In three groups, a patient who has no preference is usually assigned to an individual physician by a nonmedical admitting officer.

There has been considerable discussion of the place of the "personal physician" in group practice — that is, one who would develop an intimate physician-patient relation with the patient and who would co-ordinate and interpret to the patient the findings of other specialists to whom he might be referred. The same four groups in which the patient is the responsibility of a single physician in a given illness report that their patients, as a matter of policy and as a general rule, have personal physicians within the group membership. This relation is permitted in the fifth group if the patient expressly desires it. In all groups, the personal physician is ordinarily selected by the patients concerned.

This question was also covered in the opinion survey, the physicians being asked whether they considered it medically desirable for each patient to have a personal physician. Of 83 physicians, 76 per cent replied in the affirmative and 22 per cent in the negative; 2 per cent were noncommittal. Three of the groups were almost unanimous in favor of the personal physician relation in group practice, about two thirds of the fourth (a hospital service group) replied affirmatively, and the fifth group (a hospital reference group) had a majority (9 of 16 members) who considered it medically inadvisable or unnecessary for each patient to have a personal physician. Interestingly enough, this was not the group that has departmental rather than individual responsibility for the patients.

Among 48 physicians in four groups who thought that each patient should have a personal physician, 29 would permit the patient to choose any member of the group. Fourteen physicians believed that the personal physician should be chosen from among the general practitioners, and 5 that he should be chosen from among the internists of the group, although one of these wished to exclude physicians in the medical subspecialties.

There was no particular difference in attitude between service and reference groups concerning re-

TABLE 3. *Status of Specialist Certification of Physicians in Five Medical Groups.*

CLASSIFICATION	TOTAL NO. OF PHYSICIANS	PHYSICIANS CERTIFIED BY AMERICAN SPECIALTY BOARD		NO. OF UNCERTIFIED PHYSICIANS*	PHYSICIANS WHO HAVE APPLIED FOR CERTIFICATION		UNCERTIFIED PHYSICIANS WHO ARE MEMBERS OF SPECIALIST SOCIETIES	
		NO.	PERCENTAGE		NO.	PERCENTAGE OF UNCERTIFIED PHYSICIANS*	NO.	PERCENTAGE†
Practice not limited to specialty	14	—	—	14	1‡	7.1	2	14.2
Practice limited to specialty	89	51	57.3	38	20	57.1	15	40.5
Full time	73	41	56.2	32	18	60.0	12	38.7
Part time	16	10	62.5	6	2	40.0	3	50.0
Service group	51	29	56.9	22	9	45.0	9	42.9
Reference group	38	22	57.9	16	11	73.3	6	37.5
Private organization	40	23	57.5	17	10	67.7	5	31.3
Hospital organization	30	20	66.7	10	7	70.0	5	50.0
Industrial organization	19	8	42.1	11	3	30.0	5	45.5
Physicians under forty years of age	35	17	48.6	18	17	100.0	3	16.7
Physicians forty years and over	54	34	63.0	20	3	16.7	12	63.2
Totals	103	51		52	21		17	
Averages			49.5			42.9		33.3

*There were 3 uncertified physicians from whom information about application for certification was not obtained, and who are therefore omitted from the number of uncertified physicians in the calculation of percentages.

†There was 1 uncertified physician from whom information about society membership was not obtained, and who was therefore omitted from the number of uncertified physicians in the calculation of percentages.

‡This general practitioner has applied for certification in internal medicine.

sponsibility for the patient. The age of the physicians questioned also had no bearing on this point.

Medical Records

It is implicit in the hospital-standardization program of the American College of Surgeons that a good system of medical records (both well designed and well kept up) is essential to the operation of a first-class hospital. Outpatient records cannot be expected to attain the same standards of completeness required of hospital records, but in view of the fact that patients of a medical group are often seen by more than one physician, it seems reasonable to expect that groups should keep more complete medical records than most individual practitioners do. Clark and Clark[5] state that the essence of group work is the co-ordination of the various departments and that experience has demonstrated that the quality of the medical records in a group-practice organization reflects with remarkable accuracy the degree of co-ordination it has achieved. This statement has been taken as a working hypothesis in both the interview study and the record study, subject to confirmation or revision by the accumulation of data.

As part of the interview survey, the medical-record librarian is interviewed, and detailed information is obtained about all aspects of the record system. An attempt is also made to evaluate the extent to which the system is followed in actual operation.

It should be noted that all the groups studied were (or recently had been) shorthanded because of the war, both in physicians and in clerical help, and that all of them commented that their records at the time of the study were less well kept than before the war; all were hoping to improve the keeping of medical records when the manpower shortage became less acute.

Probably the most important single question about the systems of medical records used by groups is whether the records are kept in a unified form, with all physicians who see a patient having access to and making entries in the same record. A second question of significance is the relation of the hospital records of hospitalized patients to the outpatient records. The data presented below relate only to these two points and do not include consideration of such details of record keeping as diagnostic nomenclature, arrangement of records, filing systems and completeness with which the records are kept. Some of these factors are considered more fully in a future record study, which will be reported separately.

All four nonindustrial groups have unified systems of medical records. In the three groups that are integrally affiliated with hospitals, there is a true unit system, the clinic and hospital records of each patient being filed together in a single folder under one unit number. The fourth group has a unified record system for patients seen in the office or at home, with all such visits of a given patient recorded on the same form. In the industrial group, each family is assigned a number on the first visit of the worker or one of his dependents, but each department, in each of the two clinics that this group operates, may keep its own file of records, so that the record of a given patient may be kept and filed in several scattered fragments.

It has already been noted that three groups maintain an integral hospital-clinic unit record system of hospital records. The other groups usually enter a short note on the clinical record that the patient has been hospitalized, but as a rule few details of the patient's treatment or course are included.

Qualifications for New Members

Information on the question of qualification was obtained from two groups. In one, a hospital service group, all new members must be certified specialists. In the other group, also a service group, a general practitioner is required to have had more than one year of hospital training, and a specialist must have the full qualifications for an American specialty board, but need not actually possess a board certificate.

Postgraduate Study

Although only one group specifically required younger men to take formal postgraduate study in 1944 and 1945, all encouraged such studies. A member of one of the groups was given leave of absence with pay for a full year to continue studies in orthopedic surgery, and another physician had spent several weeks in postgraduate study. A number of physicians had taken, or were taking at the time of the study, shorter postgraduate courses. Visits to outside medical centers, often referred to as "clinic trips," were more frequent than formal postgraduate work, but were not a definite requirement in any group.

Financial Arrangements

Source of Income

All but one of the group depend principally on fees-for-service for their income. The exception is the industrial group, which is entirely supported by the sponsoring corporation. In all the fee-for-service groups, charges are said to be comparable with those made by local individual practitioners. Charges are adjusted to the patient's ability to pay, although in only one group is this ability formally investigated. In three groups, the ability of the patient to pay a specified fee is determined initially by the business-office personnel, whereas the patient's physician makes this determination in the fourth group. Any question concerning a medical bill is resolved by the business manager in one group, and by the physician involved (if necessary, in conjunction with the medical director) in the other three. In one hospital group the fee schedule is publicly listed.

Distribution of Income

From the point of view of the physicians who practice in groups, the problem of income distribution is of fundamental importance, since on its satisfactory solution depend to a considerable extent the morale of the members, the avoidance of internal friction and even the continued existence of the group. Furthermore, the method of income distribution may influence the type of medical care given — the most obvious example is the effect on intragroup consultations. Some of these methods place a premium on the extensive use of consultations, whereas others tend to penalize the use of consultations and place a premium on one member's keeping and treating a patient as long as possible. The ideal income arrangement should be such as to encourage the liberal use of consultations when indicated but not to place a premium on unnecessary consultations.

Examples of three methods of income distribution are furnished by these five groups, although it should be noted that none of them use what is probably the commonest method — that is, payment to each member of a specified percentage of the total net income of the group, which may be determined annually or may depend on point scores attained by members during the year.

The two private groups differ in their arrangements for sharing the net group income. In one, the income is divided among the members according to the money value of the work done by each department. In the other, each member of the group, whether partner or employed associate, is paid a salary, which varies according to a number of factors. The surplus net income is then divided into equal shares among the partners, each senior partner receiving a full share and each junior partner a half share. In both hospital groups and in the industrial group, all the physicians are paid salaries that are fixed annually. Training, experience, competence and length of time with the group all contribute to the salary determination in the four groups in which the salary is paid. In one of these groups, account is also taken of the money value of the work done by the various departments during the preceding year.

In the opinion survey, all 13 members of one private group expressed a preference for a salary in addition to share, whereas 14 of the 16 members of the other private group preferred a straight percentage distribution. Two members of this group regarded a fixed salary as preferable. There was lack of agreement on this question among the three groups whose members are paid on a fixed-salary basis: in one, all the members considered a fixed salary to be the preferable type of income distribution, whereas a majority of the other two groups (12 of 19 members, and 7 of 12 members) believed that payment should be on the basis of salary in addition to share.

Fiscal Analysis

Since figures were obtained as confidential information, it is not possible to publish any analysis of the actual magnitude of income and expenditures. A few words may be said, however, regarding the proportion of gross income distributed to physicians, which was ascertained for three of these groups. In the hospital groups, the percentage relation between the amount paid to the physicians and the amount received by the hospital for professional services was considered to be the percentage of gross income distributed to the physicians. In the three groups from which this information was obtained, the percentages distributed to the physicians were 61.2, 67.3 and 72.1. It may be noted that Rorem,[4] in studying twelve clinics in 1930, found distribution percentages ranging from 54.6 to 72.2, and that a poll in 1944, covering over 5000 physicians throughout the country, showed an average ratio of net income to gross income of 63.9 per cent.[6]

Volume of Work in 1945

Volume figures are difficult to get and even more difficult to interpret, since groups vary widely both in the type of figures that they keep and in the completeness with which they keep them. It has been found, in other groups as well as in the five reported herein, that the annual number of new patients seen and the total annual number of clinic visits are almost always obtainable. The number of actual patients seen in a year is almost never obtainable, and in many cases the total number of clinic visits is not differentiated to show the number of visits to physicians and the number of visits (for x-ray examination, laboratory study, physiotherapy and injections by nurses) on which the patients were not seen by physicians. Records of home calls are likely to be incompletely kept, and in the groups without integral hospital affiliation, the statistics concerning hospitalized patients are often incomplete.

In an attempt to estimate patient load per physician, a further complication is caused by the fact that the present figures relate to 1945, when all the groups had men in or returning from the armed forces. An estimate of the number of physicians practicing with each of the five groups in 1945 was therefore made, the portion of the year during which returning or new members practiced with the group and the estimated fraction of time contributed to the group by part-time members being taken into account (Table 4). These figures, although somewhat arbitrary, are thought to give a reasonably accurate picture of the actual man-years worked in each group in 1945.

A special problem regarding the hospital groups, especially those that do a large volume of referred work, concerns the definition of "new patient." The study was designed to include only outpatients, and in groups not integrally affiliated with hospitals, the

figures obtained ordinarily referred only to outpatients, but the groups associated with hospitals vary in their practices concerning new patients who are hospitalized on their first visits. In one group, practically every patient who is hospitalized is first examined as an outpatient, and this is counted as an outpatient visit. In other groups, patients referred from outside physicians are admitted directly to the hospital and are not counted as having had an outpatient visit. Some of the variations in Table 4 may be related to this factor.

Number of Office Visits and Home Calls

Office visits by patients to physicians and the total number of clinic visits are presented in Table 4.

TABLE 4. *Office Visits, Total Clinic Visits and New Patients in 1945.**

GROUP	TYPE OF GROUP	NO. OF PHYSICIANS	OFFICE VISITS		TOTAL CLINIC VISITS†		NEW PATIENTS			
			NO.	PER PHYSICIAN	NO.	PER PHYSICIAN	NO.	PER PHYSICIAN	PER 100 OFFICE VISITS	PER 100 TOTAL CLINIC VISITS
A	Reference	16	—	—	56,476	3530	9153	572	—	16.2
B	Reference	15	19,819	1321	19,819	1321	2698	180	13.6	13.6
C	Service	9	34,748	3860	50,075	5564	3400	378	9.8	6.8
D	Service	18	105,921	5884	146,866	8159	—	—	—	—
E	Service	12	—	—	20,946	1746	2923	244	—	14.0
Four groups composed entirely of specialists	—	52	54,567‡	2274‡	147,316	2833	18,174	350	10.2‡	12.3
All groups	—	70	160,488§	3275§	294,182	4203	—	—	—	—

*According to a study conducted by Ciocco and Altman[7] in 1942, the average annual patient load of 265 specialists in Baltimore, 198 in the District of Columbia and 173 in Georgia was, respectively, 3200, 3485 and 4700.

†Includes office visits to physicians and other visits, for x-ray and laboratory study and so forth, during which patients were not seen by a physician.

‡Figures from two groups.

§Figures from three groups.

In the three groups in which visits to physicians were distinguished from total clinic visits, the number of visits per physician ranged from 1321 to 5884. Total clinic visits, determined for all five groups, ranged from 1321 to 8159 per physician. Both the low figures in this column (1321 and 1746) were reported by groups integrally affiliated with hospitals and do not reflect the amount of work done for hospitalized patients. In one of these, x-ray and laboratory work is done by the associated hospital, so that the total number of clinic visits is the same as the number of office visits to physicians.

Comparison may be made between the number of office visits per physician in the two groups made up entirely of specialists and the figures obtained by Ciocco and Altman[7] in a study of 636 specialists in Baltimore, the District of Columbia and Georgia. One group reports a much smaller patient load than the Baltimore specialists, whereas the patient load of the other is exceeded only by that of the Georgia specialists.

The industrial group and one of the private service groups were the only ones reporting any appreciable number of home calls. In the latter group, there were 6355 home calls in 1945, when the group contained 9 physicians. The specialty reporting most home calls was pediatrics, which averaged 3230 calls per physician. Internal medicine was next, with an average of 1224 calls per physician.

Number of New Patients

It is hoped that this figure, interesting in itself as a crude index of volume, and hence of the degree of acceptability of group practice to the public, will also serve as a criterion of the amount of reference work done in a group. One would expect that a purely service group, taking care of a continuing clientele, would have a relatively small number of new patients per physician, or per 100 office visits, and that a purely reference group would have a large percentage of new patients.

This relation does not obtain in the four groups from which new patient figures were obtainable, but it may be pointed out again that three of these groups are integrally affiliated with hospitals, and there is reason to believe that in two, many patients are admitted directly to the hospital and are not included in the tabulation of new patients, although their hospital care actually devolves on the group members. Since hospital admission figures do not ordinarily distinguish between old and new patients, the extent of this under-reporting cannot be determined, but the direct hospital admissions almost certainly confuse the true picture.

Volume of Surgery

Comparable figures on volume of surgery were obtained from the three groups associated with hospitals. The totals for all operative procedures in 1945 (except oral surgery) were 4921, 4022 and 1409, respectively, or 547, 619 and 403 operative procedures per active surgeon. In the first and third of these groups, eye, ear, nose and throat operations

were reported separately. If these operations and the corresponding surgeons are omitted, the figures for operative procedures in the two groups become 3615 and 1239, or 603 and 620 per active surgeon.

Volume of Obstetrics

Total deliveries in four groups, including stillbirths, were 1520, or 253 per obstetrician. The volume of obstetrics does not seem to be correlated with the service or reference classification, but the hospital groups were substantially higher in the number of deliveries per obstetrician than the private partnerships. The ratio for the two hospital groups was 280 deliveries per obstetrician, whereas that for the private partnership groups was 227.

Deaths

Information regarding deaths of hospitalized patients was obtained from four groups, three of which make up the entire hospital staff. The maximum death rate was 4.8 per cent of hospital admissions, and the mean was 3.1 per cent.

Information on autopsies was obtained from the same four groups. The autopsy rate ranged from 28.4 to 93.5 per cent in these four groups, with an average of 47.6 per cent.*

*The American Medical Association requires a minimum autopsy rate of 15 per cent in hospitals approved for internship and residency.

Opinion

In an effort to determine what the physicians in group practice think of the major controversial points connected with this technic for furnishing medical care, an opinion survey of individual members was carried out. In the first three groups, this was done entirely by interviews, the analyst filling out the schedule form after completion of the interview. Beginning with the fourth group, each member has been asked to fill out the form himself, although it has proved most satisfactory to have the analyst present when he does so, to answer any questions of interpretation that may arise. Schedule revisions have also involved considerable rewording of some questions in the interest of clarity and precision. For this reason, the results are not comparable in all respects for all five groups.

The controversial questions considered in the present report are the advantages and disadvantages of group practice, the minimum number of physicians necessary for efficient group practice, and specialties. The results of the opinion survey about other questions are reported above, in the discussions of professional standards and income distribution.

TABLE 5. *Advantages of Group Practice as Rated by 84 Physicians in Five Groups.**

Advantages	Rated by First Three Groups†		Rated by Last Two Groups‡		All Five Groups§		Relative Rank in Five Groups
	No.	Per-centage	No.	Per-centage	No.	Per-centage	
Satisfaction of working in atmosphere of professional co-operation	30	62.5	10	27.8	40	47.6	2
Freedom to do one's best work and to obtain laboratory work and consultations without restrictions	13	27.1	22	61.1	35	41.7	3
Professional development stimulated by close professional contact with other members	2	4.2	14	38.9	16	19.0	6
Time for vacations, medical meetings and postgraduate study can be taken without danger of losing patients or income	6	12.5	5	13.9	11	13.1	8
Young physician is kept busy from start, so that he does not lose skill acquired during training	3	6.3	2	5.6	5	6.0	10
Young physician makes living income from start	2	4.2	3	8.3	5	6.0	11
Group practice yields larger financial returns to physician, considering career as whole	2	4.2	1	2.8	3	3.6	12
Patients benefit financially, either by reduced fees or by getting more medical care for same expenditure	9	18.8	5	13.9	14	16.7	7
Operation of prepayment plans is facilitated	0	—	0	—	0	—	13
Groups provide specialist services for small communities that otherwise could not support them	3	6.3	5	13.9	8	9.5	9
Groups give patients better medical care, by providing facilities for easy consultation, formal and informal, and for laboratory work	42	87.5	19	52.8	61	72.6	1
Physician in group is freed from details of business administration	11	22.9	9	25.0	20	23.8	5
Physician has regular daily and weekly working hours, with practice covered during time off duty	12	25.0	11	30.6	23	27.4	4

*The wording of this question in the present interview outlines is as follows: "The following are the chief advantages that have been claimed for group practice. On the basis of your own experience, please check the *three* (no more) most important reasons why you think that group practice is preferable to individual practice (if an advantage that you consider to be one of the three most important is not listed, write it in)." In the first three groups, no list was presented; each physician was asked to name the advantages, and if more than three were named, the first three mentioned were used in the tabulation presented above.

†Included 48 physicians.

‡Included 36 physicians.

§Included 84 physicians.

Advantages and Disadvantages

A compilation of the principal advantages and disadvantages that have been claimed for group practice was presented in the previous paper.[1] During the course of study, changes in the method of approaching this question have seemed necessary. In the first three groups, each member was asked to name the principal advantages and disadvantages, but this technic caused serious difficulty in the analysis of the answers, even when the analysis was limited to the first three answers of each member. Beginning with the fourth group, a list of advantages was drawn up, and each member was asked to check the three that he considered most important. A similar list of disadvantages and criticisms was drawn up, but each physician was asked to rate the degree of truth or falsity of each one, on a scale of five (strong and weak positive, neutral or no opinion, weak and strong negative).

The list of advantages presented for rating, in the order in which they are arranged in the schedules, is shown in Table 5. The answers received from the members of the first three groups were fitted as accurately as possible into the present list, the first three advantages mentioned by each physician being used. It is obvious that the first three advantages mentioned by a respondent are not necessarily those that he considers most important, and the results must therefore be interpreted cautiously. On several of the items the last two groups differed sharply from the first three, and from the data it cannot be determined whether these differences have real meaning or are related to the change in study technic.

The last two groups rated "freedom to do one's best work and to obtain laboratory work and consultations without restrictions" as the most important advantage of group practice. After this was "groups give their patients better medical care, by providing facilities for easy consultation, formal and informal, and for laboratory work," whereas in third place was "professional development stimulated by close professional contact with other members."

The first three groups gave first place to "groups give their patients better medical care and so forth," second place to "satisfaction of working in an atmosphere of professional co-operation" and third place to "freedom to do one's best work and so forth."

Because of the complete change in the technic for recording disadvantages, comparable figures were not obtained from all five groups. The disadvantages most frequently mentioned in the first three groups were as follows: a well trained specialist makes less money in group practice than in individual practice (mentioned by 29 of 48 physicians); and there is likely to be animosity toward the group

TABLE 6. *Disadvantages of Group Practice as Rated by 37 Physicians in Two Groups.**

DISADVANTAGES†	STRONGLY POSITIVE "TRUE" RATING		WEAKLY POSITIVE "TRUE" RATING		TOTAL POSITIVE "TRUE" RATING		FALSE RATING (ANY DEGREE)		PHYSICIANS NEUTRAL OR WITH NO OPINION	
	NO.	PERCENTAGE	NO.	PERCENTAGE	NO.	PERCENTAGE	NO.	PERCENTAGE	NO.	PERCENTAGE
Intimate patient-doctor relation lost in group practice; groups practice impersonal medicine. . .	6	16.2	8	21.6	14	37.8	17	45.9	6	16.2
Physicians' local professional contacts outside group limited (as by close organization of group or by animosity of outside practitioners)	8	21.6	10	27.0	18	48.6	14	37.8	5	13.5
Claimed advantages of close professional co-operation lost because of internal friction	1	2.7	1	2.7	2	5.4	28	75.7	7	18.9
Patient's choice of consultants lost	7	18.9	10	27.0	17	45.9	15	40.5	5	13.5
Patients subjected to unnecessary consultations and laboratory work	2	5.4	9	24.3	11	29.7	22	59.5	4	10.8
Group organization stimulates unethical practices (soliciting, advertising, press publicity)	0	—	0	—	0	—	31	83.8	6	16.2
General hospitals approved by American College of Surgeons (with regular staff meetings, many specialists and better laboratory and x-ray facilities) more effective than medical groups in stimulating physicians' professional advancement and in providing highest type of medical care for patient‡	10	27.0	1	2.7	11	29.7	16	43.2	10	27.0

*Both these groups are service groups, and the answers recorded apply only to service groups.

†The present schedules contain the following additional item: "Group practice yields smaller financial returns to the well trained specialist, considering his career as a whole." The two groups reported were not asked to rate this statement.

‡There is some doubt whether all respondents made the desired distinction between "groups," whether or not they are associated with hospitals, and "general hospitals" not staffed by groups. The wording in the present schedule is: "General hospitals, not staffed by groups but approved by the American College of Surgeons, are more effective than medical groups in stimulating the physician's professional advancement and in providing the highest type of medical care for the patient."

on the part of outside practitioners (mentioned by 18 of 48 physicians).

Table 6 presents the disadvantages that members of the fourth and subsequent groups have been asked to rate as to degree of truth or falsity, with the number of physicians, out of 37 members of the fourth and fifth groups, who considered each item true to any degree. It should be noted that both these groups are service groups, and the answers reported here apply only to service groups. The two disadvantages receiving the highest number of positive votes are that physicians' local professional contacts outside the group are limited and that patients' choice of consultants is lost, although fewer than half the 37 respondents considered either of these statements true to any degree.

Minimum Number of Physicians Necessary for Efficient Group Practice

This question was designed to determine what the physicians actually in group practice consider to be the smallest organization that can be thought of as a "real group," since one of the problems of defining a group practice unit concerns the minimum size. (The American Medical Association[3] reports took three full-time members as the criterion in this respect.) In the first three groups studied, the members were asked what they considered the minimum number of physicians necessary for efficient group practice. A number of respondents answered "two," on the theory that even this small number of physicians can practice more satisfactorily as a team than as individuals. In addition, few of the men could eliminate from consideration the size of the potential patient load, the hospital facilities available and the services provided by other physicians in a specific community. In other words, few of them had set up any ideal concepts, but related the question to specific localities and circumstances.

In these three groups, the members were also asked which specialties, if any, should be represented in every group. A number of replies to this question implied a larger number of members than the respondents had allowed in their replies to the previous question, and it seemed obvious that this approach gave a better picture of the respondents' "ideal minimum." Beginning with the fourth group, therefore, these questions have been combined, and members have been asked to indicate the specialties, and the number of physicians in each specialty, necessary for a service group to do an effective job of group practice. The recommended minimum size of the whole group is then derived from these figures.

In the first three groups, the estimates of the minimum number of physicians necessary for efficient group practice, made by 44 respondents, ranged from 2 to 19, with group averages of 4.2, 5.8 and 6.0. In the last two groups, the estimates of 32 respondents ranged from 6 to 31, with group averages of 14.9 and 8.6. The members of the industrial group, apparently reflecting the large size of their own organization, gave the comparatively high average estimate of 14.9. If only the four non-industrial groups are considered, the average estimate is 6.0.

Specialties

Practically all (97 per cent) of the 76 respondents included internal medicine and surgery as specialties necessary for efficient group practice. Obstetrics or gynecology, or both, was included by 83 per cent, eye, ear, nose and throat by 83 per cent, radiology by 66 per cent and pediatrics by 30 per cent. A scattering of other specialties was also recommended as necessary for even the smallest efficient group. There was considerable variation from group to group regarding the specialties thought to be necessary, and in general the answers seemed to reflect the composition of the respondents' own group.

Because of the variations in meaning of the term "general practitioner," this phrase was not used in the survey of the first three groups, but the members were asked whether it was advisable to have a "general medical man" in every group. Thirty of 31 physicians answered "yes," but many of them qualified their answer by stating that the internist could and should act in this capacity. Since it was obvious that the term "general medical man" called up the concept of "personal physician" to their minds, this designation was abandoned, and in later groups the term "general practitioner" has been used in this question. In the two groups in which it was asked whether a general practitioner should be included in every group, 15 of 35 physicians answered in the affirmative (14 of 23 in one group, and 1 of 12 in the other).

Summary

Some of the findings of an intensive interview study of five medical groups in New England and the Middle Atlantic States are presented. The data are offered primarily as illustrations of the kind of information sought in the study and are not necessarily indicative of the nature of group practice in general. It is hoped that the additional studies now being carried out in other parts of the country will furnish sufficient data to warrant more definite conclusions.

The five groups studied have been established for from seventeen to thirty years; they are all larger than the average group, and all but one are located in comparatively small communities. Two groups are reference groups, and the other three are service groups. Two are private groups, two are hospital groups, and one is an industrial group.

All the groups provide a wide variety of medical services. All provide office and hospital care, and four of the five provide home care.

In three groups, the members form the complete staffs of the hospital with which the groups are affiliated. The hospitals used by all five groups are approved by the American College of Surgeons.

The average age of 109 physicians in these five groups is forty-three years, and the full-time members have had an average of three and a half years of hospital training. Eighty-nine (86 per cent) of 103 physicians limit their practice to a single specialty; 57 per cent of the specialists are certified by American Specialty Boards, and an additional 17 per cent are members of recognized specialist societies.

The various concepts of the term "general practitioner" and the place and functions of general practitioners in group practice are discussed.

All the groups have regular staff meetings, but there is some variation in the degree of professional supervision and the responsibility for patients.

The sources and distribution of the income of the groups are discussed, and the variations described.

An analysis is made of the volume of work done by these groups in 1945.

Some of the results of an opinion survey of the members of these groups are presented, covering questions of professional supervision, distribution of income, the advantages and disadvantages of group practice, the minimum size of effective groups and the specialties that should be represented in groups.

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SPLENIC CYST

Report of a Case

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CYSTS of the spleen present the rarest forms of cystic disease in abdominal organs. The first case of cystic tumor of the spleen was reported by Andral in 1829. Over the period of a hundred and fourteen years since that time only 163 cases have been published in the medical literature, the last review being that of Harmer and Chalmers.[1] Since the case presented below was of the false type of hemorrhagic cyst, it is interesting to note that Denneen[2] mentions that from 1904 to 1942 there were only 8 cases of splenic cyst at Bellevue Hospital, none of the hemorrhagic type, and that in the thirty years prior to 1940 there were no cases of hemorrhagic cyst at St. Vincent's Hospital.

Fowler[3] summarizes his classification of splenic cysts as primary, which may be congenital, traumatic, inflammatory or parasitic, and secondary, which may be due to trauma, degeneration or inflammation.

The classification of McClure and Altemeier[4] comprises true cysts, — that is, those lined by specific secreting membrane, — including the epithelial (dermoids and epidermoids), the endothelial (lymphangiomas, hemangiomas, polycystic disease and some serous cysts) and the parasitic, lined by protoplasmic matrix containing numerous nuclei (hydatid cyst caused by echinococcus); and false cysts, with no specific secreting lining, including the hemorrhagic, the serous and the inflammatory types (due to acute necrosis, with infection, or tuberculosis) and degenerative liquefaction of infarction areas caused by embolism or arterial thrombosis.

Fowler[3] found cysts in 71 per cent of cases reviewed. Although a history of trauma was given in 23 per cent of 137 cases, it cannot be accepted as definite proof of the origin of any particular case. With so few cases available for study, the etiology of false cysts is still obscure.

The majority of splenic cysts are found in the age group between twenty and fifty years, occurring more frequently in women, especially during the child-bearing period.

The history in such cases usually mentions symptoms due to pressure on adjacent organs. Since the stomach and the splenic flexure of the colon are generally encroached on, nausea, epigastric distress, flatulence and constipation are common. Pain of varying degree is due to pressure against the abdominal wall and adhesions to neighboring structures.

Although Pool[5] and McClure and Altemeier[4] consider the diagnosis difficult, Sweet[6] states that phys-

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ical examination and x-ray studies of the stomach, colon and kidneys provide conclusive evidence. Physical examination is usually negative except for the palpable mass in the left side of the abdomen. In the case presented below the diagnosis was made difficult because the spleen could not definitely be made out on account of tenderness and spasm of overlying muscles and a long, narrow thoracic cage, the lower ribs being close to the iliac crests. In cysts of the lower pole the splenic notch cannot be felt, but in those occupying the upper pole with downward progress of the spleen the anterior margin may be palpable. Sweet observed a fluid wave in 2 of his cases, but I cannot see how a fluid wave can be elicited in an encapsulated cyst unless it contains air or is flabby and loosely attached.

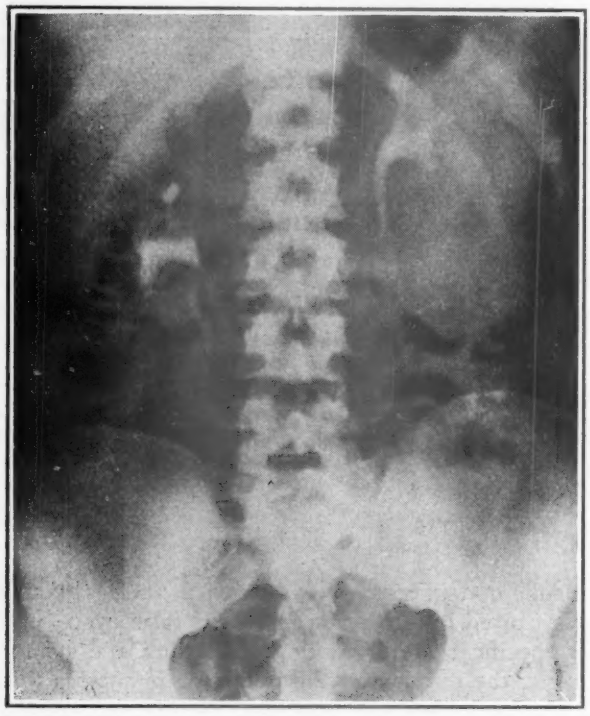

FIGURE 1.

The splenic flexure can be seen pushed downward, and the stomach pushed to the right. The kidney is in normal position.

The chief evidence is obtained by x-ray examination. The stomach may be displaced to the right, and the splenic flexure of the colon pushed downward — Benton[7] states that downward displacement of the splenic flexure is almost pathognomonic of splenic cyst. The kidney may also be pushed downward. The diaphragm may be high, with impaired motion. Ostro and Makover[8] reported their x-ray findings in a case of splenic cyst and studied a case of splenomegaly due to chronic myeloid leukemia. In the latter case the position of the stomach and the splenic flexure was normal. The downward displacement and anterior enlargement of the spleen were not believed to have displaced neighboring organs in the same manner as in patients with cysts.

Cysts of the spleen must be differentiated from other causes of splenomegaly, including cystic diseases of the pancreas, mesentery, omentum, left lobe of the liver, ovary and kidney. Sweet[6] found the left costal margin pushed outward, which does not occur as a rule in pancreatic and rarely in ovarian cysts. Dobrzaniecki[9] stated that pneumoperitoneum may be useful in doubtful cases. In cases in which the differential diagnosis is difficult, blood smears, bone-marrow biopsies and liver-function tests must be done.

The only treatment for cyst of the spleen is splenectomy. The case reported below represents a splenic cyst of the false type. The diagnosis was not made preoperatively because one of the presenting symptoms was hematemesis. Gastric bleeding with splenomegaly may be caused by obstruction to splenic veins, as in splenic-vein thrombosis. In this situation blood is shunted through the vasa brevia of the stomach, varices may form in the gastric wall, and bleeding may occur. In portal obstruction, as in cirrhosis of the liver, bleeding may occur from stasis of the veins in the portal system. Diseases of the blood, such as purpura, may also cause hematemesis. It might be postulated that pathologic conditions of the spleen, with pressure on the stomach, produce stasis and congestion and that the strain of vomiting is sufficient to initiate bleeding.

CASE REPORT

R. H. (J. H. 35125), a 23-year-old single man, was first seen about 4 weeks prior to admission to the hospital with the chief complaint of severe pain in the left side of the abdomen. The present illness had begun about 14 years previously, when the first attack of upper abdominal distress and vomiting had occurred. The symptoms lasted about 3 days, and morphine was required for relief. There was a question whether hematemesis occurred at that time. In the following 3 years there were two recurrences of a similar nature. In 1942, while in the Army, the patient had a sudden bout of epigastric distress with nausea, vomiting and hematemesis. After this acute upset he noted vague abdominal distress for some time. For some reason the symptoms were not carefully investigated, and he was discharged from the service with a diagnosis of rheumatic fever and neurosis, although he had had no joint pains at any time. He remained fairly well except for a weight loss of 70 pounds. About 1 week before the present episode another bout of abdominal distress, vomiting and hematemesis had occurred. The patient subsequently had constant soreness in the upper abdomen and in the left hypogastric area. There was an occasional sharp pain, aggravated by lying down and eating. There was moderate subjective tenderness in the left side of the abdomen. There were no other systemic complaints.

The past history was otherwise negative for bleeding, enlarged lymph nodes and exposure to tropical disease. The patient had never been jaundiced. There was no history of recent or remote trauma to the abdomen.

Physical examination revealed a tall, thin, well developed man with evidence of weight loss. The skin showed no petechiae or rash. The pupils were equal and regular and reacted normally; the scleras were clear. There were a few small posterior cervical and inguinal lymph nodes. The thyroid gland was not palpable. The heart and lungs were normal to percussion and auscultation. The abdomen was flat, and there were no visible masses. There were no hernias. The liver could not be felt. There was marked tenderness and

spasm in the left side of the abdomen, especially in the upper half, with some tenderness in the left lumbar area. Because of this spasm the left kidney, spleen and any mass in this area could not be properly defined. The lower portion of the thoracic cage extended almost to the iliac crest. There was no edema or varices in the extremities, and the reflexes were normal.

The blood pressure was 120/70.

X-ray examination after the intravenous injection of Diodrast showed a large mass, presumably the spleen, occupying the left side of the abdomen and reaching almost to the iliac crest (Fig. 1). The stomach was displaced to the right and the splenic flexure displaced downward. The kidney was in normal position. Blood studies were negative.

It was believed that splenectomy should be done but because of the interesting findings the patient was referred to Dr. William Dameshek, of Boston, for further evaluation. Dr. Dameshek referred him for laboratory investigations to the Joseph H. Pratt Diagnostic Hospital, where examination of the blood disclosed a white-cell count of 3700. A blood smear was normal, as was the urine. The total serum protein was 6.8 gm. per 100 cc., with an albumin of 4.8 and a globulin of 2.0 gm.; the total cholesterol was 162 mg., the free cholesterol 45 mg., the cholesterol ester, 117 mg., and the total bilirubin 1 mg. per 100 cc. The prothrombin time was 17 seconds (control, 15 seconds).

A sternal puncture showed hypocellular preparation, with only two or three clumps of marrow present. The granulo-

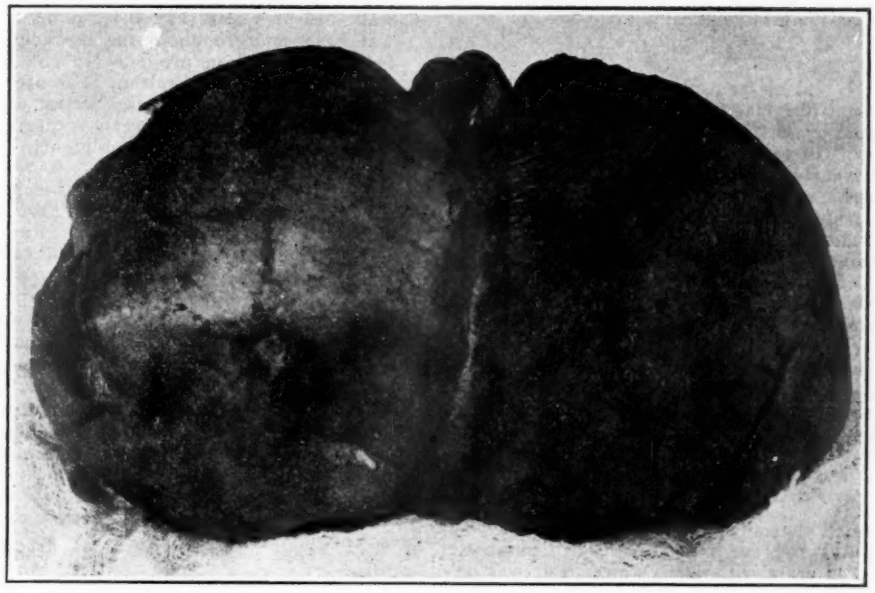

FIGURE 2.

The lower half of the spleen is replaced by a smooth, unilocular cyst.

FIGURE 3.

Specimen bisected, showing the coagulated blood attached to the wall of the cyst. The cyst was filled with sanguineous fluid.

cytic cells were predominantly mature. Relatively few cells of myelocytic stages were noted. There was a marked increase in the percentage of eosinophils. Polymorphonuclear and metamyelocytic stages were present. There was a slight increase in plasma and reticulum cells. Megakaryocytes were present in a fair number, actively producing platelets. The diagnosis was splenic-vein thrombosis.

X-ray examination disclosed no esophageal varices.

Dr. Louis Weissfuse made the following diagnosis and comment:

> The diagnosis is splenic-vein thrombosis, with infarction of the spleen. The diagnosis of splenic-vein thrombosis was suggested by Dr. Dameshek on the basis of personal observations. In these cases there was a history of hematemesis since early childhood, splenomegaly after the episode of hemorrhage without the occurrence of cirrhosis of the liver. At autopsy these cases were found to have been due to thrombosis of the splenic vein, with return flow of blood through the vasa brevia of the stomach and with dilatation and subsequent rupture giving rise to the episodes of hematemesis. None of the cases showed any evidence of cirrhosis of the liver. In the patient under discussion all tests revealed the liver function to be perfectly normal. There was no evidence of esophageal varices. The therapy in these cases has thus far been unsuccessful. Splenectomy has been ineffectual in relieving the hematemesis and has frequently given rise to postoperative thrombocytosis and thrombosis of veins throughout the body, with subsequent death.

Dr. Leonard suggested that splenectomy be performed with the use of Dicoumarol to prevent postoperative thrombotic episodes. After consultation with Dr. Dameshek it was decided to perform splenectomy.

The patient was admitted to the Jordan Hospital on January 10, 1947, and operation was performed on January 11. He was given pontocaine-glucose by fractional spinal method supplemented by Pentothal Sodium and nitrous oxide and oxygen. The abdomen was opened through a long left upper paramedian incision. Because of the patient's narrow build this incision was crossed just above the umbilicus by a transverse incision transecting the left rectus muscle and splitting the internal oblique and transversalis muscles. Excellent exposure was obtained.

The lower half of the spleen was found to be replaced by a large unilocular, smooth, symmetrical cyst. Numerous adhesions to the left anterior and lateral walls and to the splenic flexure of the colon were freed manually. The spleen and cyst were easily delivered. The presplenic fold was cut, and the lower portion of the gastrosplenic ligament was clamped, cut and ligated. With the specimen held medially the tail of the pancreas was freed from the hilus, and the splenic vessels were secured individually after opening of the lienorenal ligament. The remainder of the gastrosplenic ligament was clamped and cut, and the specimen removed. All vessels were individually ligated with No. 1 chromic catgut. Through the lesser peritoneal cavity the splenic vein was exposed at the upper border of the pancreas, and no evidence of preoperative thrombosis was noted. The liver was normal to inspection, and no biopsy was taken. The wound was closed in layers with interrupted cotton sutures.

The patient received a transfusion of 500 cc. of citrated blood during the operation, and he left the operating room in excellent condition. The pathological report by Dr. Frank Mayner was as follows:

> The specimen consists of a spleen measuring 19 by 10 by 8 cm. (Fig. 2 and 3). One pole comprises a large cyst measuring 10 by 10 by 8 cm. The outer surface is smooth. It is filled with semisanguineous fluid. The inner surface is rough, owing to the deposition of coagulated blood. The wall measures less than 0.1 cm. in thickness. The cyst wall is intact throughout the specimen and in the portion next to the spleen proper. No communication is found with any part of the spleen. The area nearest the spleen contains coagulated blood. Section of the spleen shows nothing unusual. The organ is firm in consistence and reddish purple, and the malpighian corpuscles are not seen.
>
> Microscopical examination of the cyst reveals a few red cells near and attached to the fibrous tissue lining the thin wall. The wall consists of fibrous tissue measuring in thickness between 15 and 20 cells. Section of the spleen shows prominent sinuses and pulp, which are empty and contain little or no blood. The capsule and trabeculae are normal. The malpighian corpuscles are moderately hyperplastic. The diagnosis is hemorrhagic cyst of the spleen.

The patient had an uneventful convalescence and was discharged from the hospital on the 10th postoperative day. Since discharge he has felt better than he had in years and is gaining weight steadily. He has no more pain and so far has had no complaints. When he was seen on February 28 by Dr. Dameshek, physical examination and blood studies were completely negative.

Summary

A case of false cyst of the spleen of the hemorrhagic type is reported. Because of hematemesis a preoperative diagnosis of splenic-vein thrombosis was made. The etiology of the hematemesis could not be explained after thorough study.

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FAILURE OF THE PERITONEAL-BUTTON OPERATION FOR ASCITES

Report of Two Cases

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THE surgical treatment of patients with recurrent massive ascites that requires frequent abdominal paracentesis has long been a challenging problem. Operative procedures designed to remedy the defect have carried an appreciable mortality, particularly in patients with portal obstruction due to hepatic cirrhosis who develop ascites relatively late in the course of the disease. Such procedures fall into several well defined groups. Some of these are designed merely to rid the patient of an oppressive volume of fluid; others attempt to eliminate factors in the production of ascitic fluid, and still others attempt to improve the body economy by returning water, electrolytes and protein to the general circulation. To this last group belongs the peritoneal-button operation, in which a flanged glass tube is inserted between the peritoneal cavity and a pocket made in the subcutaneous tissues of the anterior abdominal wall. This has the theoretical advantage of providing a constant slow clysis of the patient's own blood transudate and the practical advantage of being a relatively simple operation that can be done under local anesthesia. Details of this procedure have been described by Crosby and Cooney.[1] This principle has been employed with minor changes in technic and with varying degrees of enthusiasm over a period of years. Tannahill[2] reported the use of such a button in 1930. More recently, with the improved medical management of patients suffering from hepatic insufficiency and with better control of surgical infection, interest in this operation has been revived.

It is the purpose of this paper to report experience with 2 patients who were provided with peritoneal buttons and subsequently subjected to post-mortem examination.

CASE REPORTS

CASE 1. D. V. (P.B.B.H. A-47-32), a 57-year-old Greek kitchen helper with a known diagnosis of portal cirrhosis, was admitted to the hospital for operation after a 3½-month period of recurrent ascites. During the month prior to admission this fluid reaccumulated after paracentesis at 10-day intervals to the point of producing respiratory distress. On November 22, 1946, a glass peritoneal button of the Cooney type was inserted. The postoperative course was uneventful, and the patient encouragingly developed marked edema of the lower abdominal wall and genitalia. He was discharged from the hospital 15 days later with no evidence of reaccumulation of peritoneal fluid. On December 18, however, less than 1 month after operation, fluid had reaccumulated so that he again required paracentesis. During the next 3 months, until the time of death, a total of 46,700 cc. of ascitic fluid was removed from the abdomen at intervals ranging from 1 to 3 weeks. This fluid had a constant specific gravity of 1.010 with total protein determinations ranging from 0.52 to 0.68 gm. per 100 cc. The serum protein was maintained in the range of 5.9 to 6.6 gm. per 100 cc., with albumin-globulin ratios of between 0.3 and 1.0. The patient died on March 23, 1947, after a massive gastrointestinal hemorrhage from the rupture of an esophageal varix.

Autopsy. Post-mortem examination revealed marked wasting of the upper part of the body, with a prominent abdomen and bulging flanks. Moderate edema of the genitalia was present, but no appreciable edema of the lower abdominal wall or of the lower extremities was noted. There was an 8-cm., inverted, curvilinear, well healed, right rectus skin incision at the level of the umbilicus, as well as numerous old and recent, midline, lower abdominal scars from the paracenteses. The umbilicus was flat, and no caput was seen. On opening of the peritoneal cavity 6500 cc. of cloudy, straw-colored fluid was released. The peritoneal surfaces were white, smooth, shiny and opaque. The deep aspect of the peritoneal button was seen anchored firmly in place, with a silk pursestring suture, 5 cm. below and to the right of the umbilicus. The button was free of adhesions, the lumen was patent, and there was no increased peritoneal reaction in its vicinity. A segment of abdominal wall measuring 15 by 12 by 3 cm. was then removed from the right lower quadrant. The subcutaneous tissues appeared identical at the transected superior and inferior margins of the block and measured 1.5 cm. in thickness. A collapsed subcutaneous cystic space measuring 10 by 7 by 4 cm. and communicating with the peritoneal cavity was identified (Fig. 1). This had a smooth, white, glistening, trabeculated surface with numerous shallow diverticulums at its margins. There was a single, firm band of scar tissue running from the floor to the roof of the cavity in the vicinity of the button. This lining, whose appearance was entirely similar to the previously described peritoneal surface, could be seen arching evenly into the defect provided by the button. The glass button was freely movable within its tract, and there was no visible reaction about its flanged neck. The wall of this cavity could be identified as a tough fibrous layer 0.15 cm. in thickness. Beyond it the layers of the abdominal wall were readily defined. A zone of yellow lobular fatty tissue separated the cyst wall on one side from the anterior rectus sheath and on the other from Scarpa's fascia. Microscopical sections taken from the superficial and deep layers of this wall (Fig. 2) presented evidence of an old inflammatory process with formation of a layer of dense, poorly vascularized, fibrous tissue. There was some scarring of the adjacent fat, with thickening of connective-tissue trabeculae and occasional perivascular foci of mononuclear inflammatory cells. There was a separate, thin, cellular, lining layer composed of flattened, elongated, darkly staining cells. Additional findings consisted of a diffusely nodular, firm liver weighing 960 gm., histologic examination of which revealed toxic cirrhosis, an engorged spleen weighing 340 gm. and a blood-filled upper gastrointestinal tract with a well defined perforation of an esophageal varix.

CASE 2. D. B. (P.B.B.H. A-46-148), a 46-year-old federal employee, gave a history of having consumed over a pint of whisky a day for many years. He was admitted to the hospital in August, 1946, with a diagnosis of portal cirrhosis following 4 months of recurrent ascites that required frequent abdominal paracentesis. On August 16, a Cooney type of peritoneal button was inserted. In spite of this procedure, fluid continued to accumulate, and repeated paracenteses were again necessary. One month after operation, 9000 cc. of fluid was removed, and 8 days later, at the time of death, a massive collection of ascitic fluid had again developed. The fluid obtained had a low specific gravity, with a total protein of 0.27 gm. per 100 cc. The total serum protein in

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that period varied from 5.3 to 5.7 gm. per 100 cc., with albumin-globulin ratios of from 0.3 to 0.5. The hospital course was unremittingly downhill, with signs of generalized hepatic insufficiency, cholemia and terminal convulsive episodes.

Autopsy. Post-mortem examination disclosed marked pitting edema of the legs, genitalia and body to the level of the costal margins. The skin and scleras showed a yellowish discoloration, and there were numerous areas of ecchymosis. The superficial veins were prominent over the lower abdomen, upper chest and arms. The abdomen protruded 9 cm. above the costal margin, and the umbilicus was everted. There was a 9-cm., healed, curvilinear incision, with the convexity downward, located 3 cm. below and to the left of the umbilicus.

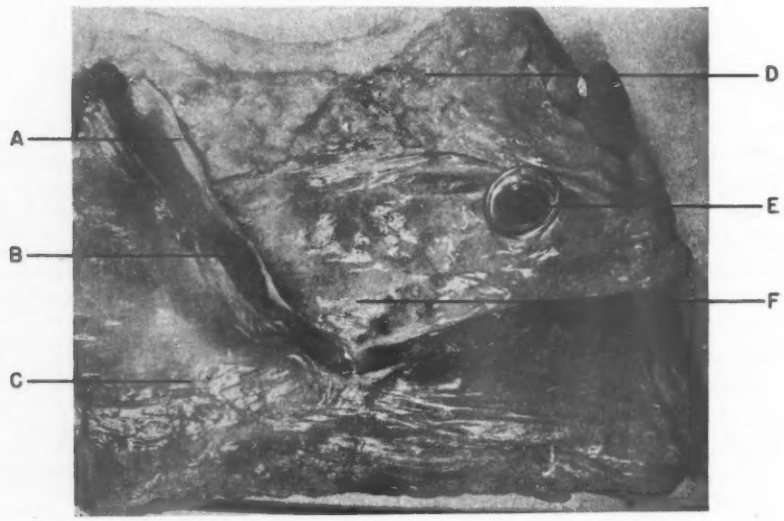

FIGURE 1. *Portion of Subcutaneous Space in Case 1.*

A *shows the anterior rectus sheath,* B *the rectus muscle,* C *the peritoneum,* D *subcutaneous tissues,* E *the superficial aspect of the peritoneal button and* F *the lining of the cavity.*

Beneath this skin flap was a circumscribed fluctuant area. On incision of this area, a subcutaneous fluid-filled space lined with a smooth, glistening membrane was encountered. The outline of this cavity was irregular, and there was some trabeculation at its margins. The cavity measured 4 by 2.5 by 3 cm. The flanged neck of the superficial portion of the button could be seen occupying the central portion of the floor of the space. When the peritoneal cavity was opened,

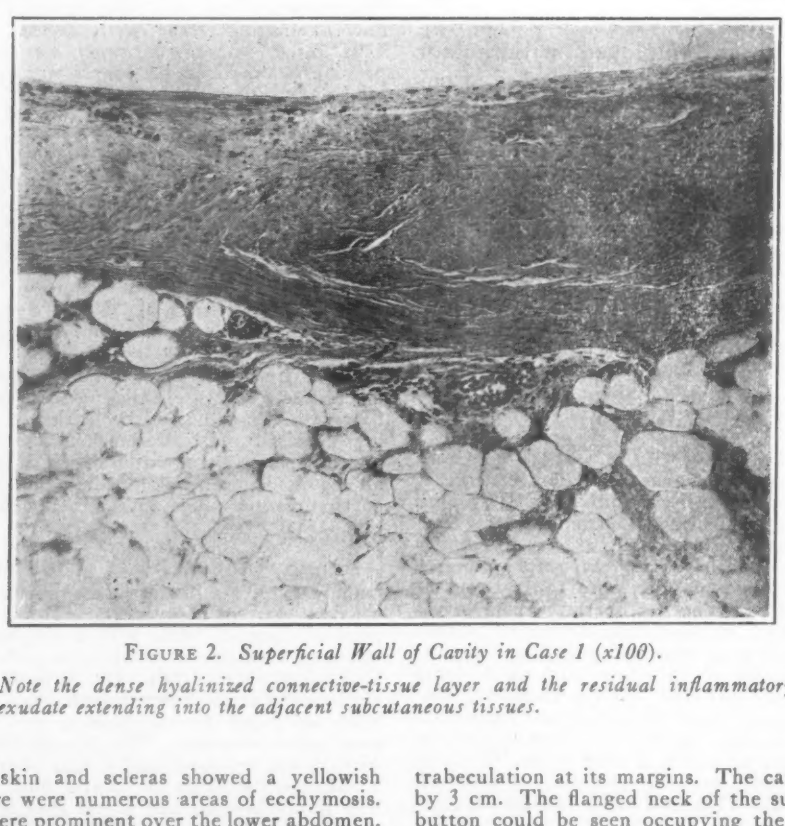

FIGURE 2. *Superficial Wall of Cavity in Case 1 (x100).*

Note the dense hyalinized connective-tissue layer and the residual inflammatory exudate extending into the adjacent subcutaneous tissues.

8600 cc. of thin, straw-colored fluid was released. The subcutaneous tissues varied from 0.3 to 1.0 cm. in thickness. The peritoneal surfaces were smooth, white and glistening but again opaque. The deep portion of the peritoneal button was readily identified. There was no increased peritoneal reaction in its vicinity; no adhesions were found, and the lumen of the button was patent. The peritoneal layer blended evenly with the wall of the canal provided by the button and was continuous with the lining of the subcutaneous space. Additional findings consisted of a firm, diffusely nodular liver weighing 1160 gm., a noticeably distended portal vein, a large, firm spleen weighing 495 gm. and evidence of the establishment of an elaborate collateral circulation. Microscopical examination of the liver and pancreas revealed extensive deposits of hemosiderin. This finding led to a primary diagnosis of pigment cirrhosis.

Discussion

Although experience with the peritoneal-button operation for ascites is limited, the opportunity to study the reasons for failure in 2 consecutive cases presented itself. In both cases, subcutaneous pockets, which had dense, hyalinized, connective-tissue walls, communicated with the peritoneal cavity. The similarity of the findings in these cases suggests that the formation of such a pocket follows a predictable histologic sequence.

Several factors seem to be of importance in producing this situation. The limitation of the size of the cavity in each case to approximately the limits of the surgical dissection implies that there is a factor of operative trauma with a subsequent attempt at repair. The subcutaneous pocket is maintained by a constant outpouring of fluid from the abdominal cavity. The ascitic fluid alone at times may attain a hydrostatic pressure equivalent to 30 cm. of water. In addition, any sudden increase in intra-abdominal pressure is transmitted to this subcutaneous space. Thus, in Case 1 it was suggested that the patient had developed a ventral hernia at the site of operation because of a swelling that appeared in the erect position. This had the configuration of the cavity described and transmitted an impulse on coughing.

Infection in a subcutaneous dead space is often seen in other surgical situations and may increase the extent and degree of scarring. This is suggested in the microscopical section from the cyst wall in Case 1, in which residual foci of mononuclear inflammatory cells were found.

A high concentration of protein in ascitic fluid may, in some cases, be a factor in the formation of a fibrous barrier to absorption of fluid. Foord et al.[3] in a study of ascitic fluid from patients with hepatic cirrhosis, found an average total protein of 1.32 gm. per 100 cc., with some as high as 3.09 gm. It cannot be said that the protein concentration was a major factor in the cases presented above, since at no time was the total protein content of ascitic fluid recorded above 0.68 gm. per 100 cc. This value is well within the limits found in edema fluid obtained with Southey tubes from patients in congestive failure.[4] Such a fluid would probably not initiate an active fibrosis.

At some time within the first month after operation the space thus maintained becomes lined with mesothelium but not until the lateral limits of the cavity have become permanently defined by marginal scarring. At this stage the situation approaches that of a bursal cavity, with a smooth gliding surface and an intervening fluid layer. When the abdomen is emptied by paracentesis this space becomes collapsed, but with reaccumulation of fluid it refills much like a "bay" of the peritoneal cavity. Any absorption that occurs from such a space is automatically limited by the small area of surface exposed. In addition, the added storage space provided in the 2 cases (250 and 25 cc. respectively) was insignificant.

Summary

Two cases of hepatic cirrhosis requiring repeated abdominal paracentesis for recurring ascites and treated surgically with a peritoneal button are presented. The effects of these operations were considered negligible after periods of two to four weeks.

An opportunity was provided for post-mortem study of these cases with the discovery of a subcutaneous cystic space having a dense fibrous wall and communicating with the peritoneal cavity in each case.

It is suggested that the formation of a subcutaneous pocket with a dense connective tissue wall and a mesothelial lining follows a predictable histologic sequence. Because of the small area of surface exposed and the fibrous character of the wall, little absorption can take place from such a cavity.

The peritoneal-button operation did not provide an effective, sustained, slow clysis of ascitic fluid in these cases.

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MEDICAL PROGRESS

DIAGNOSTIC ROENTGENOLOGY: CONGENITAL LESIONS OF THE HEART AND GREAT VESSELS: NEPHROGRAPHY

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A NUMBER of years have passed since the last progress report on diagnostic roentgenology. As had been anticipated, roentgenology proved to be an essential part in the medical routine of the armed forces. Photofluorography, which received its first intensive test in this country, became a routine part of the examination of the chest on entry and at discharge from the service. Even if one considered the inaccuracies and fallacies of any such survey, one was impressed by the comparative rareness of tuberculosis in the armed forces and could not help crediting the survey films with part of this improvement over the situation during World War I.

Photoelectric exposure meters, which were used extensively in connection with mass photofluorography, were found to be of distinct advantage.[1, 2] A greater use of such meters can be predicted, and it is likely that they will become a routine part of roentgenologic equipment.

As in the past, advances in roentgenology have been stimulated by progress in other phases of medicine. A good example has been the increased interest and progress in the accurate diagnosis and treatment of congenital anomalies of the heart and great vessels.

CONGENITAL LESIONS OF HEART AND GREAT VESSELS

Increased interest in the roentgenologic examination of congenital cardiovascular lesions was caused by the brilliant developments of surgery in the correction or alleviation of certain of these anomalies. The roentgenologic differentiation of these lesions is difficult. The fact that a combination of several abnormalities is often present further complicates the diagnosis. In many cases, particularly in infancy, the roentgenologist has been satisfied with the diagnosis of an abnormal heart and has not attempted further differentiation regarding the type of the abnormality. It is true that a wealth of observations has been accumulated over the course of years.[3–5] The studies of interauricular septal defect by Bedford, Papp and Parkinson[6] and of complete transposition of the great vessels[7] and of aortic atresia by Taussig[8] are more recent examples. But progress was slow, since autopsy was the only way of proving the diagnosis.

Quite often it appeared that the recognition of the correct diagnosis was more important for the satisfaction of a brilliant diagnostician than for the patient, and interest in these lesions was confined to a small group of clinicians and roentgenologists. This has changed rapidly within the last few years with the advent of corrective surgery for some of the anomalies. An exact preoperative diagnosis is now of great clinical value.

The knowledge gained from observation of a larger number of patients checked at operation rather than at autopsy, as well as independent roentgenologic observations stimulated by the surgical triumphs, produced a more objective evaluation of the roentgenologic findings than had been possible in the past. Roentgenologic studies in some cases were found to be the most helpful single diagnostic procedure available.

Methods of Examination

Roentgenologic examination in patients with cardiovascular anomalies should always include careful fluoroscopy. The size and shape of the heart and of the rest of the middle shadow are studied in various diameters, as are the pulsations of the cardiac chambers, the great vessels and the lung vessels. It is advisable to examine the esophagus routinely with barium to determine possible abnormal displacement by the cardiovascular system. For the same reason, the position and shape of the trachea are observed. Spot films are taken during fluoroscopy wherever needed — for example, in the study of the esophagus and trachea.

Roentgenography is performed in the positions that are most profitable from the fluoroscopic observations. At times, it is wise to repeat fluoroscopy for the study of certain areas after review of the radiograms. The shape of the chest cage is noted. Large lung fields apparently caused by air hunger are the most obvious roentgenologic evidence of congenital heart lesions in some cases in infants.[9]

The roentgenologist should be given the clinical findings. He must be sufficiently familiar with congenital heart disease to be able to make use of them.

In recent years, two methods that are helpful in certain cases of congenital heart lesions have been added to the diagnostic armamentarium. They are catheterization of the heart and angiocardiography. Both procedures are specialized examinations requiring an experienced team and special equipment.

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Catheterization of the heart. Forssmann,[10] in 1929, introduced a long, radiopaque catheter first into his own antecubital vein and later into those of patients and succeeded in passing the catheter into the heart without injury. Until recently, this method has been used only occasionally, either for the study of blood pressure and oxygen content in the right side of the heart or for the direct introduction of contrast mediums into the heart. The procedure in the beginning appeared hazardous, and the results did not seem to warrant the chances that the investigator took.

The rapid progress of cardiovascular surgery in recent years, however, and the necessity for all available help in accurate preoperative diagnosis have stimulated further investigation with amazing results. Catheterization is usually performed in centers in which a cardiologist, a cardiovascular surgeon, a physiologist, a chemist and a radiologist work together to solve the puzzles of congenital heart lesions. Results have been published from several of these centers.[11–14]

Sosman[13] and Dexter[14] have given an excellent description of the indications, technic, errors, results, interpretation and value of heart catheterization. A waxed, radiopaque catheter is introduced into the median basilic vein. The catheter has a slightly rigid bend near its end that allows guidance in the desired direction by twisting. Under fluoroscopic control the catheter is passed through the vena cava into the right auricle, into the right ventricle and finally into the pulmonary artery. For other investigative purposes it can be guided through the right auricle into the inferior vena cava. The pressure in these various parts of the heart and large vessels is determined through the catheter, and blood samples are obtained for oxygen-content determinations. Spot films of the catheter are taken in each position in which these determinations are being made. This results in an excellent charting of the conditions within the right side of the heart and the pulmonary artery. Abnormal variations in the pressure of heart chambers and pulmonary artery and of the oxygen content in various locations may be detected and they are often of diagnostic significance, as in interauricular septal defect, in interventricular septal defect, in pulmonary stenosis, and in patent ductus arteriosus. In addition, the abnormal communications within the heart may at times actually be demonstrated by the position of the catheter. The catheter may thus pass directly from the right to the left auricle, from the right into the left ventricle or, in cases of the tetralogy of Fallot, from the right ventricle directly into the overriding aorta. At the time of publication, the authors had performed catheterizations in 100 cases without mishap. Autopsies of patients who later died of causes not connected with the procedure failed to show evidence of damage to the endothelium of the superior vena cava, the right auricle, the right ventricle, the pulmonary arteries or the valves. It is obvious that this procedure should be performed only when an adequate team is available. In the hands of such a team the information obtained is often invaluable.

Angiocardiography. In a previous progress report[15] the principle of angiocardiography was discussed. After several attempts by various investigators to demonstrate the heart chambers and the interior of the great vessels by injection of dye into the arm vein either directly or through a catheter Robb and Steinberg[16] demonstrated a practical method in 1939. It consisted of radiography of the heart and great vessels following rapid injection of 30 cc. of 70 per cent Diodrast (twice the concentration used in intravenous pyelography). Since the original publication, valuable information has been obtained by this method. The position, size and shape of the heart chambers, valves and great vessels have been studied, and knowledge obtained that had not previously been available. Many questions of topographic anatomy of the living person were clarified. It was possible to obtain a moving film demonstration of the flow of the dye through the vena cava, the right side of the heart, the pulmonary arteries through the lungs to the pulmonary veins, the left side of the heart and the aorta.[17] This was an excellent demonstration of anatomy and physiology of the lesser circulation. The method was used successfully in the differential diagnosis of aortic aneurysms and mediastinal tumors. It was also applied for the study of congenital anomalies of the heart and great vessels. Intracardiac shunts were demonstrated, particularly those from the right side of the heart through a septal defect to the left side and aorta, as in the tetralogy of Fallot and Eisenmenger's syndrome.[18] The patent ductus arteriosus itself was not filled with dye, but accompanying anomalies were visualized,[19] as pointed out below. The method is not a part of the routine examination. It necessitates experience and a special team to produce satisfactory results and should be reserved for research centers.

Recently Chavez, Dorbecker and Celis[20] reported their results with injection of dye through a rather wide catheter, which was introduced in the jugular vein. This article is cited, not because this procedure is expected to be repeated by others (fatalities following the intracardiac injection of dye have been reported) but on account of the illustrations that were made possible by the introduction of dense dye into the heart chambers and the great vessels. They are of special interest in the study of congenital heart lesions.

Roentgenologic Studies in Specific Congenital Abnormalities

Patent ductus arteriosus. In 1939 Gross[21] described the first successful closure of a patent ductus arteriosus. Four years later Donovan, Neuhauser and

Sosman[22] reported from the same hospital the roentgenologic findings in 50 cases that had been verified at operation. This represented at that time a unique experience, since no one had previously had the chance to compare the roentgenologic appearance of the heart and great vessels before and after operation.

The previously vague and contradictory roentgenologic literature on patent ductus arteriosus was now on a solid footing.

The variations from normal found in order of frequency were: dilatation of the pulmonary artery, which, although present in 82 per cent of cases, was rarely marked; cardiac enlargement, which was usually only slight and limited to the left side (large hearts were rare in uncomplicated patent ductus arteriosus); dilatation of the left auricle; engorgement of intrapulmonary vessels, which was usually not striking except when combined with endocarditis; exaggerated pulsation of the left ventricle and pulmonary artery; and increased hilar pulsation (so-called "hilar dance"), which was present in a third of the cases.

Postoperatively, the heart size was usually not much changed. Pulsations of the left ventricle and pulmonary artery were found to be decreased, the pulmonary vessels were often smaller than before operation, and the left auricle had decreased in size.

The roentgenologic examination alone does not establish the diagnosis, but it suggests the diagnosis, contributes important confirmatory evidence and bears important witness to the effectiveness of the treatment.[23]

Angiocardiographic studies gave additional information. Steinberg, Grishman and Sussman[19] found localized dilatation of the descending aorta in the region of the patent ductus arteriosus. It was present in 26 of 27 cases. In addition, the main pulmonary artery and its left branch were elevated as if drawn toward the isthmus of the aorta. Dilatation of the main and the major branches of the pulmonary artery was present in 75 per cent of cases. Various degrees of left ventricular dilatation were seen. The ductus itself could not be demonstrated by the opaque medium.

It is rarely necessary to apply angiocardiography to the diagnosis of patent ductus arteriosus. The main importance of studies like these lies in the additional information that is gained for routine roentgenologic examinations. Thus, it should be possible to demonstrate the localized bulge of the aorta during fluoroscopy.

At times, the scar of a closed ductus arteriosus can be seen in adults. A small area of calcification close to the upper edge of the pulmonary artery simulating a calcified lymph node was found to represent calcification in the scar.[24]

Congenital heart disease with cyanosis. In 1945 Blalock and Taussig[25] reported the successful surgical intervention in cyanotic patients in whom the pulmonary circulation was impaired, usually owing to pulmonary stenosis and associated defects. The condition is generally found in the tetralogy of Fallot (pulmonary stenosis, ventricular septal defect, an aorta that rides over the defect and right ventricular hypertrophy). The diagnosis is at times quite difficult, particularly if additional anomalies are present. The roentgenologist can be of help in some cases. The heart, even if not enlarged, shows an abnormal blunting of the elevated apex, the so-called "coeur en sabot" or "sheep's nose heart." The right ventricle is seen to be enlarged, and the pulmonary artery and its branches are small.

Roentgenologic examination is helpful in the differentiation of the tetralogy of Fallot from Eisenmenger's syndrome, a combination of anomalies similar to the tetralogy but without pulmonary stenosis. The clinical picture of the two conditions may be similar, but the Blalock operation is of no help in Eisenmenger's syndrome. Roentgenologically, the pulmonary artery is found to be normal or enlarged in contrast to its narrowing in the tetralogy of Fallot. Angiocardiography at times gives helpful information.[18]

Catheterization of the heart is valuable in the diagnosis of the tetralogy of Fallot. A low pressure in the pulmonary artery and an increased pressure in the right ventricle permit the diagnosis of pulmonary stenosis. At other times, the catheter can be introduced from the right ventricle directly into the overriding aorta and thereby can give a beautiful visual demonstration of the abnormal bloodstream. It is obvious that catheterization of the heart may be of help in the differential diagnosis of the tetralogy of Fallot and Eisenmenger's syndrome.

A great number of variations are possible between the tetralogy and Eisenmenger's syndrome, depending on the degree of collateral circulation for the lung. Bing[26] uses, in addition to catheterization, respiratory studies to determine the pulmonary blood flow. Eisenmenger's syndrome may be called one extreme of these variations with excellent blood flow into the lung through the pulmonary artery. Cases with complete absence or obliteration of the pulmonary artery (so-called "truncus arteriosus solitarius") represent the other extreme. In these cases the lung receives its blood supply from other sources, such as the bronchial arteries. Since the normal hilar shadows are produced by the branches of the pulmonary artery, it is not surprising to find an almost complete absence of the hilar shadow in these cases.[27]

Vascular ring around trachea and esophagus. The normal aorta and the large vessels arising from its arch are the end result of a complicated system of six bilateral branchial arteries. This system represents an ideal opportunity for numerous congenital variations, and nature quite often has chosen abnormal variants, the majority of which, although they may represent interesting roentgenologic appearances, do not produce clinical symptoms. The right-sided aorta is the most characteristic example for such a variation. In this anomaly,

the aortic arch lies to the right and posteriorly to the esophagus instead of to the left and anteriorly, as in normal cases. Abnormal displacement of the esophagus and trachea characterizes this condition roentgenologically. Only in rare cases does it produce clinical symptoms such as dysphagia. The recognition of this anomaly is, however, important, since it is not infrequently associated with other congenital anomalies, as in the tetralogy of Fallot.

In certain cases both the right and the left sides of the aortic arch persist, and a vascular ring formed by the two arches surrounds the trachea and the esophagus. Roentgenologically, this anomaly was first diagnosed in 1925.[28] Isolated cases have subsequently been reported. It was found that this arrangement at times produces definite clinical symptoms, particularly of the respiratory tract, including repeated episodes of upper respiratory infection starting in early infancy and stridor, which is more marked during feeding; dysphagia is less striking.[29]

Recent successful ligation and division of one limb of the vascular ring with the resulting freeing of the trachea[30, 31] have increased the interest in the roentgenologic appearance of this anomaly, particularly since the diagnosis mainly rests on the roentgenologic findings. Neuhauser[32] describes 4 cases, 2 of which came to operation. The esophagus showed a round pulsating defect posteriorly at the level of the aortic arch. In the anteroposterior view at the same level the esophagus was slightly narrowed from both sides. The trachea just above the carina was seen to be narrowed and displaced anteriorly. The tracheal deformity is best seen after lipiodol installation but may be seen without lipiodol in anteroposterior, oblique or lateral views, if looked for fluoroscopically and with spot films.[31] In some cases the descending aorta lies to the left of the spine, and in others to the right. A correct roentgenologic recognition of this course may be of importance prior to surgical intervention.[31] A vascular ring may easily be missed on routine examination. It is the responsibility of the roentgenologist to think of this possibility, particularly in children with repeated upper respiratory infection and stridor. As stated above, the diagnosis usually depends on his examination. It is likely that some variations in the roentgenologic appearance will be noticed, with an increase in the number of cases observed and operated on.

Coarctation of aorta. The roentgenologic changes seen in coarctation of the aorta have been described in many papers. At times, the hypertrophy of the left ventricle, the widening of the ascending aorta, the small aortic knob, the peculiar notching in the upper portion of the descending aorta and, in particular, the erosion of the inferior edges of the ribs produced by the tortuous dilated intercostal arteries are so characteristic as to allow an unequivocal diagnosis. In other cases the roentgenologic findings are less marked. Recent successful resection of the coarcted area has permitted a check of the roentgenologic findings.[33, 34] Gladnikoff[35] analyzed the appearance of the left upper border of the cardiovascular shadows in operated cases. He emphasized the recognition of the dilated left subclavian artery, a medial displacement of the aortic arch and an indentation in the upper portion of the descending aorta as signs of coarctation. When these changes are present in the absence of the common, pathognomonic notched ribs they are of particular diagnostic significance.

Classification. The number of congenital anomalies of the cardiovascular system is so large that a simplified grouping has been found to be advantageous. The one generally used is that of congenital heart lesions with or without cyanosis. It is interesting to attempt a classification of these lesions from a completely different approach. Sussman and his coworkers[36] fully recognizing the present impossibility of establishing a complete diagnosis from x-ray study alone, attempt a roentgenologic classification of these lesions. They differentiate lesions with an enlarged pulmonary-artery segment of the cardiac contour; those with a normal or small pulmonary-artery segment and with right or left ventricular enlargement; right aortic arch; and dextrocardia.

Although progress in the diagnosis of these lesions has been so rapid that this classification appears incomplete and somewhat schematic in the light of newer developments, it is quite helpful and is particularly recommended as an introduction to the roentgenologic study of congenital lesions of the cardiovascular system.

A new monograph on the subject of congenital heart disease has been announced by Taussig, and will be available soon. It will represent the experiences of the Johns Hopkins' group, and should prove to be of great interest and value.

Nephrography

After the intravenous injection of organic iodine salts like Diodrast for the demonstration of the kidney pelves and ureters, the shadow of the kidneys increases slightly in density. The increase in density is usually only minimal. Early observers, however, noted that if pyelography was performed while one ureter was acutely obstructed, a fairly marked increase in the density of the kidney might occur on the involved side. If the pain stopped spontaneously, a sudden outpouring of dye into the kidney pelvis and ureter took place, with a decrease in the density and size of the kidney. Wilcox[37] confirmed these clinical observations by experiments in rabbits. Clamping off of one ureter for forty-five minutes resulted in increased size and density of the kidney, but some dye was still excreted into the kidney pelvis. If the ureter was clamped off for sixty minutes, this excretion stopped while the kidney still increased in density. Immediately after release of the clamp the dye poured out into the kidney pelvis, and the kidney returned to its normal size and density. The accumulation of dye in the kidney

parenchyma during the ureteral obstruction was much greater than could be explained by accumulation of dye-containing blood in the kidney. Collection of dye in the uriniferous tubules following the increased pressure in the kidney pelvis was thought to be a decisive if not the entire reason for this phenomenon. More recent discussions on this subject are found in articles by Nowell[38] and by Florence, Howland and Weens.[39]

This phenomenon is of clinical significance. If marked unilateral increase in the density of a kidney and no excretion of intravenous dye on the same side are observed, the presence of acute obstruction can be assumed, although the obstructing agent, such as a small stone or blood coagulum, may not be seen. The phenomenon also proves the presence of a functioning kidney in the absence of dye excretion into the kidney pelvis. In cases of long-standing ureteral obstruction with absent kidney function an increase in density will not take place during the intravenous pyelogram. Finally, the phenomenon proves for all practical purposes that the obstruction is acute.

For a number of years various authors have wondered whether it might not be possible to use this phenomenon for the diagnosis of localized disease in the kidney parenchyma. Recent papers in the literature have attacked this problem and shown some practical results. During intravenous pyelography in a patient with acute ureteral obstruction, Hellmer[40] saw increased density of the involved kidney with the exception of the lower pole, which kept its original density. A repeated intravenous pyelography a few days later, after the colic had subsided, showed excretion into the kidney pelvis. The pelvis was deformed by a tumor of the lower pole. In other words, during the phase of obstruction that apparently had been caused by a blood coagulum, the kidney had increased in density where normally functioning tissue was present but not in the region of the tumor. A similar appearance was produced in a patient who had a renal cyst and acute ureteral obstruction. In a third case of renal colic, an apparently normal kidney pelvis was seen on the involved side, but localized increase in density was noted in the kidney above the pelvis. Three and a half hours after the injection this density disappeared and a second smaller kidney pelvis was filled in the upper pole of the kidney. In other words, this patient had double kidney pelves and ureters with transient obstruction in one of the ureters. Hellmer called the increased density of the kidney a nephrogram. A satisfactory nephrogram is observed only in the presence of acute ureteral obstruction.

Recently, Weens and Florence[41] published their results with artificial nephrography. These authors introduced a Dourmashkin dilating bougie into the proximal or middle ureter. Then they gently dilated the small rubber bag at the tip of the catheter with 5 cc. of mercury. This was followed by intravenous injection of 30 to 35 cc. of Diodrast (35 per cent). If the injection was delayed by ten to twenty-five minutes after the dilatation of the bag only small amounts of dye were seen in the kidney pelvis, and a satisfactory increase in the density of the kidney shadow was obtained thirty minutes after injection of the dye. The kidney was also slightly enlarged. Normal density and size of the kidney reappeared a few minutes after deflation of the rubber bag. Some patients had no pain; others had mild or marked pain, but not enough to prohibit the procedure, if the patient was prepared with 20 mg. of Pantopon. Transient hematuria (for not more than one day) was observed in 3 cases, but was probably not more than could be expected from instrumentation. The authors did not report cases in which their method had been of diagnostic value.

Further studies will be necessary to prove that this method is harmless. If so, it will add a new tool to our diagnostic armamentarium useful in individual cases, such as those of unexplained unilateral hematuria with normal routine intravenous and retrograde pyelograms.

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CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

Weekly Clinicopathological Exercises

FOUNDED BY RICHARD C. CABOT

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CASE 33461

PRESENTATION OF CASE

A fifty-five-year-old housewife entered the hospital because of a mediastinal mass.

Eight years previously the patient had been admitted to the hospital for the first time because of a lump in the left breast. There were no other complaints. X-ray studies of the chest, spine and pelvis were negative. A radical mastectomy was performed. The pathological diagnosis was adenocarcinoma (Grade II). The axillary lymph nodes were not involved. A cervical polyp was also removed. This, when examined microscopically, showed extremely severe squamous-cell metaplasia. Sterilization doses of x-ray were administered to the pelvis, and the patient was discharged. Six months later she was readmitted for a hysterectomy. The resected uterus showed an inactive endometrium and chronic endocervicitis. She recovered uneventfully. For several years thereafter she felt perfectly well, and numerous examinations, including at least one chest x-ray film, were entirely negative. Approximately seven years after the original operation the patient reported for a periodic examination complaining of weakness, weight loss and nervousness of six weeks' duration. These symptoms had begun quite abruptly. In spite of a normal appetite she had lost 13 pounds during this period. There had been some intolerance to heat and moderate palpitation and dyspnea on exertion. She had noticed no swelling in the neck or prominence of the eyes. The bowel habits remained unchanged.

Physical examination at that time revealed a well nourished woman. The skin was warm and dry. There was a fine, even tremor of the hands and tongue. No abnormality of the eyes was noted. The chest and abdomen were normal. There were no enlarged lymph nodes. The thyroid gland was palpable but not enlarged and gave no bruit or thrill.

The blood pressure was 138 systolic, 80 diastolic, the pulse 100, and the respirations 25.

The basal metabolic rate was +15 per cent. Urinalysis was negative. The cholesterol level was 223 mg. per 100 cc., and the cholesterol esters 141 mg. A blood Hinton test was negative.

A routine chest film showed an oval-shaped, soft-tissue mass of smooth outline, measuring 5 or 6 cm. in its greatest diameter, in the region of the aortic arch. This mass compressed the trachea and displaced it anteriorly and slightly to the right and also displaced the esophagus somewhat to the right and posteriorly. Fluoroscopy confirmed the finding. The mass did not interfere with swallowing. The esophagus showed no motion in this region, and the mass appeared fixed to both trachea and esophagus. It did not pulsate but could not be separated from the aorta, which it seemed to displace slightly to the left. The heart and lungs were not remarkable. X-ray examination of the bones was negative.

A tracer dose of 100 millicurie units of radioactive iodine was given with 30.8 per cent excretion during the first twenty-four hours and 1.4 per cent during the second. The blood iodine was 8.7 microgm. per 100 cc. Repetition of the basal metabolic rate and the blood iodine showed figures of +3 per cent and 5.3 microgm. per 100 cc.

The patient was followed closely as an outpatient and improved a great deal during the next few months. The nervousness, palpitation and dyspnea gradually subsided without specific treatment. She gained several pounds in weight, and six months later was admitted to the hospital for study of the

mediastinal mass. At that time she felt well, complaining only of slight palpitation on exertion. She had never experienced any difficulty in swallowing or pain in the chest. There had been a slight hacking cough for one or two years but no hemoptysis or increased sputum.

Physical examination revealed no noteworthy abnormality. The thyroid gland was not palpable, but there was slight tenderness to pressure over the right lower pole.

The temperature was 98°F., the pulse 70 to 80, and the respirations 20. The blood pressure was 136 systolic, 90 diastolic.

The x-ray appearance of the mediastinal mass was unchanged. Review of the previous chest x-ray films showed that this same mediastinal shadow had been present five years before and had not changed during this period.

An operation was performed.

Differential Diagnosis

Dr. Joseph C. Aub: A sorely needed mastectomy had been done eight years before entry. The uterine polyp probably never would have become malignant, and why so "much ado about nothing," I do not know. At any rate, x-ray therapy was given, I suppose because of the breast carcinoma. Why the uterus was removed puzzles me. It makes me think that she was a nervous woman or had a nervous doctor, but I get the impression that she was nervous. I do not know whether anyone has ever gone into the psyche of the patient at these exercises.

Seven years later symptoms due to either a neurotic storm or hyperthyroidism developed. That is suggestive of hyperthyroidism, although the basal metabolic rate was only +15 per cent. The mass pushed the trachea forward not backward, and if this report is correct, it was fixed to the trachea, esophagus and aorta. If it was a thyroid tumor it should not have been fixed to the trachea or esophagus and should not have been posterior to the trachea. The description suggests a blood supply from the surrounding area, and therefore implies that the mass was not carried down into the mediastinum like a thoracic goiter.

"A tracer dose of 100 millicurie units of radioactive iodine was given with 30.8 per cent excretion during the first twenty-four hours and 1.4 per cent during the second." That certainly is in favor of hyperthyroidism. A hyperthyroid patient will hold on to a great deal of iodine and not excrete it. The blood iodine was 8.7 microgm. per 100 cc. If that was protein-bound iodine, it was above normal values and also suggests hyperthyroidism. Nothing is said about scanning the thyroid gland or mediastinum to see if too much radioactive iodine was retained there.

If the thyroid gland in the neck were shielded — and the amount of radioactive iodine in the mediastinum so determined — and if found high one would have to make a diagnosis of mediastinal thyroid tissue. No such therapy as thiouracil was given. Is that right?

Dr. Tracy B. Mallory: Yes.

Dr. Aub: The second basal metabolic rate was +3 per cent, and the second blood iodine was 5.3 microgm. per 100 cc. Those are within normal limits, so that we must decide that she did not have hyperthyroid disease. The hacking cough is much more suggestive of neurosis than hyperthyroidism, although patients with mediastinal thyroid glands may cough. The lack of pain in the chest and the lack of sputum and hemoptysis are against a recurrence of the breast tumor.

May we see the x-ray films?

Dr. Stanley M. Wyman: The original film was initially interpreted as normal. I certainly would call it normal if reading it routinely. As the subsequent examinations unfold, however, and the mass in the mediastinum is noted, it is apparent in review of the first film that there is increased density and that the tracheal shadow does not come down to the upper border of the aorta as it should. This mass is really ovoid. It comes down very close to the aorta and pushes the trachea to the right. In the lateral view the trachea is seen to be displaced anteriorly and is considerably compressed, measuring half the normal diameter. The esophagus is pushed backward. This is a plain film showing the mass. The oblique view shows a good mucosal pattern in the esophagus, with no significant delay or obstruction. The mass is in contact with the wall of the esophagus, and probably adherent to it. The same can be said of the trachea in this view, because the outline of the trachea is slightly irregular and nodular.

Dr. Aub: Is the trachea definitely anterior to the mass?

Dr. Wyman: Yes; and the esophagus is posterior to it. The statement is made that the mass could not be separated from the aorta, but I believe that one can outline the aortic arch at that point, with the mass lying to its right. The mass apparently has not changed in five years.

Dr. Aub: The first decision to make is whether this mass was benign or malignant. Did it have anything to do with the carcinoma of the breast, or was it related to the uterus? Was this an additional cancer? I do not believe that it was a malignant tumor. It had been present for five years and had not enlarged. It was adherent, which is suggestive of malignancy, but the edges were smooth. It did not grow into the esophagus. There is no evidence that it was growing into the trachea, except for cough, which may have come from impingement on the trachea. Therefore, I think that this was a benign tumor. I shall be disappointed if that diagnosis proves wrong.

The next question is whether this was a benign tumor in contradistinction to intrathoracic thyroid tissue. That seems to me to be the significant differential diagnosis in this case. There are two important points. That the mass was adherent to the esophagus and trachea and did not invade either of them suggests to me that the blood supply was local rather than one carried down from the neck. Therefore, the trouble may have been an inflammatory condition, such as tuberculosis, rather than a benign tumor, but since I do not see any suggestion of tuberculosis in the lung, I have no right to make that diagnosis. The second important factor — and one that I think is also against a mediastinal thyroid gland — is the position of the mass behind the trachea. I do not know of a mediastinal thyroid gland in that position.

There is evidence for hyperthyroidism. As I have already said, the patient appears to have been a nervous woman. Certainly, she was willing to be operated on. There is not a great deal to suggest hyperthyroidism, except for the first radioactive iodine test, and I am not sufficiently convinced about that to lay too much stress on it. At any rate the differential diagnosis rests between hyperthyroidism with a substernal goiter and a benign tumor that had been present a long time. Let us discard the thyroid gland because of the position, adherence and lack of consistent evidence of toxicity. Let us say that it was a benign tumor. If a benign tumor, it must have been one of the connective-tissue tumors, and, on the whole, judging by the law of chances, it would be a neurofibroma. This last part is pure guesswork. I think that the patient should have been operated on if this was an adenoma of the thyroid gland and even if it was a benign tumor, because there was no way of determining what it was; such an operation is good cancer therapy, to avoid the possibility of malignancy and metastasis from the breast, which I do not consider likely. I should guess mediastinal adenoma of the thyroid, and I believe that that diagnosis is wrong. What was the hospital preoperative diagnosis?

Dr. Helen B. Pittman: We went through all the same troubles that Dr. Aub has, but for a much longer time. The patient was not a nervous woman. She was co-operative and somewhat irritated that we paid so much attention to the symptoms that did not bother her. Hysterectomy was done because she had an easily bleeding cervix that looked abnormal, and we thought that it should be removed. We followed her in the thoracic clinic, and Dr. Schatzki did a great deal of fluoroscopy on her. The initial group that saw her thought that the diagnosis fell between metastatic node and mediastinal thyroid gland, and since one does not operate on metastatic lymph nodes in the mediastinum, she was given iodine, to determine if we could pin the trouble on the thyroid gland. She remained in good health, and the mass did not change in appearance. It was decided that it was benign.

Some months later the opinion was that the lesion was probably either a bronchiogenic cyst or an intramural or extramural tumor of the esophagus, which ought to be removed as good general prophylaxis.

Dr. Earle M. Chapman: This patient was seen in the Tumor Clinic, where opinion varied. I can sum it all up by reading the final note made by Dr. Cope: "The diagnosis is impossible, short of operative exposure."

Dr. Donald S. King: Dr. Castleman thinks that I ought to be able to name this lesion, but I cannot. I did not see the patient. It seems to me more like a tumor in the esophageal wall. That is the best that I can make of it.

Dr. Wyman: I would be surprised if this were a tumor in the esophageal wall, Dr. King.

Dr. King: Could it not be in the wall and not involve the mucous membranes?

Dr. Wyman: Such tumors usually cause more spreading of the esophagus, especially a mass of this size. With intramural lesions the esophagus appears more adherent, is displaced more and is thinned.

Dr. King: Yes; but I remember a case that did not; I therefore think that it is still possible that this was an esophageal-wall tumor.

Clinical Diagnosis

Mediastinal cyst.

Dr. Aub's Diagnosis

Benign intrathoracic tumor of connective tissue (not intrathoracic goiter).
Neurofibroma?

Anatomical Diagnosis

Bronchiogenic cyst.

Pathological Discussion

Dr. Mallory: This patient was operated on by Dr. Richard H. Sweet. He found a tumor mass very densely adherent to the trachea, to the esophagus and to nearly all the other surrounding structures. In attempting to mobilize it he broke the wall and released some mucoid fluid similar to that commonly seen in bronchiogenic cyst. He was eventually able to free the cyst entirely and get it out in a collapsed state.

The microscopical sections from the wall of the cyst showed that it was lined with ciliated respiratory epithelium. Usually, cartilage is also to be found in the cyst wall. In the case under discussion we did not succeed in identifying cartilage, although there were old foci of calcification. This is not a rare location for bronchiogenic cysts. It is the same region in which tracheoesophageal fistulas

are found, and abnormal bronchial buds in this area are common and may develop into cysts of considerable size.

DR. AUB: I do not believe that one can make that diagnosis before operation, do you?

DR. MALLORY: It would be no more than a guess.

CASE 33462

PRESENTATION OF CASE

A thirty-five-year-old para II was admitted to the hospital because of abdominal pain.

The patient's menstrual periods had begun about fourteen years before admission, occurring every twenty-eight days and lasting three to five days with no excessive bleeding until about seven years later, when she became pregnant. The pregnancy ended in a miscarriage, after considerable bleeding requiring a dilatation and curettage. She had two subsequent pregnancies six and three years before entry. With the last pregnancy she spent five months in bed to prevent a miscarriage and after delivery had excessive periods. Eight months prior to admission she had a dilatation and curettage and fifteen hours of radium treatment. Following this she developed a "pelvic abscess," which required five weeks of bed rest, penicillin and general supportive care and was finally drained rectally. Subsequent to the radium treatment the patient developed hot flashes, and the periods ceased. Injections prevented the hot flashes. After this the patient did well until four months before entry, when she began having pain almost constantly in both lower quadrants in the suprapubic region. The pain was sometimes relieved by urination or bowel movements. It was not referred, and had no association with food intake. Twelve hours prior to admission the patient had nausea and vomited once. She had been passing gas and had been anorexic for forty-eight hours prior to admission. She denied chills, fever or vaginal discharge and stated that she had recently lost about 12 pounds of weight.

Physical examination disclosed no enlargement of the heart, and the lungs were clear. In the right lower quadrant of the abdomen there was a hard tender mass about the size of an orange. Over this was a small olive-sized mass that rolled under the palpating finger and produced pain. A pelvic examination was not done.

The blood pressure was 130 systolic, 80 diastolic.

Examination of the blood revealed a hemoglobin of 12.4 gm. and a white-cell count of 10,000. The urine was normal.

A plain film of the abdomen revealed small amounts of gas in both the large and the small bowel, without distention, and a poorly defined area of soft-tissue density in the right pelvis. There were no unusual areas of calcification. The temperature, pulse and respirations remained normal, and on the second hospital day an operation was performed.

DIFFERENTIAL DIAGNOSIS

DR. JOE V. MEIGS: This patient must have had some endocrine disturbance or an anatomic abnormality in the genital tract, such as a fibroid, to account for the multiple miscarriages. Following her last pregnancy she had abnormal menses and eight months before admission was treated with radium. It is impossible to guess the amount of radiation she received merely from the duration of the treatment, but it was obviously great enough to induce menopausal symptoms. I believe that it is not wise to use radium in a woman only thirty-five years old with a benign condition. At that age the patient would be far better off if operated on. The uterus, cervix and if necessary the tubes could be removed, but the ovaries should be left in place. Then the patient would not be condemned to the prolonged use of estrogens to combat menopausal symptoms. This patient was evidently treated with estrogens, since the symptoms were relieved by "injections." Again, we do not know the dosage or the duration of the parenteral treatment. It would be important to know if the treatment was continued up to the time of admission.

DR. TRACY B. MALLORY: We have no further information about that.

DR. MEIGS: That radium therapy is not without danger and may produce serious consequences is demonstrated by this case, since a pelvic abscess developed after its use. This abscess may have been due to perforation of the uterus at the time of application of the radium, or it is possible that a preexisting pelvic inflammatory disease flared up following the treatment. Certainly, the patient developed salpingitis with a pelvic peritonitis, which was drained through the rectum.

One can imagine that the most recent episode, which brought the patient to the hospital, represented another flare-up of the process. Again, she may have had enlargement of the uterus that was due to the accumulation of fluid above a cicatrix of the cervix. The estrogens, if continued, may have induced bleeding from the endometrium, and the blood could not escape through the cicatrized cervix, producing a hematometrium. That would cause pain.

The occasional relief of pain when the patient urinated or moved the bowels suggests inflammatory disease. However, she denied chills, fever or vaginal discharge. The white-cell count was normal, and the hemoglobin satisfactory. She had complained of anorexia and had recently lost 12 pounds in weight, but there was little evidence of any systemic reaction such as one would expect with inflammation.

I find it difficult to understand why no pelvic examination was done. It might have helped explain the confusing findings on abdominal palpation. The

mass described in the "right lower quadrant" could, I suppose, be an enlarged uterus full of blood, and the small tender mass a fibroid. Or the big mass itself could have been a fibroid, with a smaller one attached to it. The mass could equally well have been an ovary — either an ovarian abscess or simply a large cyst of the ovary. The x-ray examination does not help me. X-ray diagnosis can be incorrect in interpreting masses in the pelvis.

I believe that the best bet is that this young woman, who had a radiation-induced menopause, developed pelvic inflammation, was treated with estrogen for the hot flashes and then developed enlargement of the uterus without vaginal discharge, must have had a cicatrix of the cervix, with an accumulation of blood in the uterine cavity.

My diagnosis is radiation cicatrization of the cervix and hematometrium. My second choice is some sort of inflammatory mass associated with the right adnexa, representing a recurrence of the pelvic inflammatory disease.

Clinical Diagnosis

Pelvic inflammatory disease?

Dr. Meigs's Diagnoses

Cicatrix of cervix, post-radiation, with stenosis of cervical canal.
Hematometrium.

Anatomical Diagnoses

Cicatrix of cervix, post-radiation, with stenosis of cervical canal.
Hematometrium.
Leiomyoma of uterus.

Pathological Discussion

Dr. Mallory: Dr. Meigs's prediction was correct. At operation an extensive pelvic peritonitis was found with dense adhesions binding all structures together, but no pockets of pus or evidence of acute inflammatory reaction. The uterus was large and soft, and there was a small fibroid on its surface. A hysterectomy was performed with some difficulty. When the uterus was opened the cervical canal was found to be completely obliterated, and the uterine cavity was full of blood, of which part was fresh and part obviously old.

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THE DIETARY TREATMENT OF HYPERTENSION

THERE has been of late a considerable renewal of interest in the dietary treatment of essential hypertension. Doubtless from time immemorial and certainly from recorded medical history, much attention has been paid to diet in health and disease. A good deal of the benefit from diets has been found incidentally or empirically.

In 1866 Karell[1] introduced a diet for the effective treatment of edema and heart failure. It was a starvation ration consisting of only 800 cc. of milk a day, and was limited in salt intake and fluids, as well as in calories. This diet is still, on occasion, used in the initial treatment of severe congestive heart failure.

In the early years of the twentieth century it was clearly proved that a low-sodium intake could clear edema due to congestive heart failure.[2] Hypertension was not specifically described in these cases, however, and it is doubtful if the blood pressures were recorded. When hypertension became well recognized as a cause of disease, dietary treatment of various sorts was instituted. The commonest of all kinds of such diet has been a simple reduction diet, low in calories, mostly because of restriction of fat and carbohydrates. Not infrequently there has also been, with a reduction of weight, a reduction of blood pressure, although such a relation has not always been found.

Moreover, during the early part of this century and even earlier, it had been customary to reduce the protein intake, largely by restriction of meat and eggs in patients with so-called "Bright's disease" with or without actual nephritis or congestive heart failure that might be secondary to hypertension. With a restriction of the amount of any food taken, but particularly with restriction of meat and eggs, the salt intake was coincidentally reduced and may well have had an important bearing on some of the good results noted, especially in patients with congestion.

In the 1920's, considerable interest was evoked in the use of a low intake of sodium chloride in the treatment of hypertension, with emphasis on the chloride. During those years there were controversies about the effects[3, 4] but the reduction of sodium itself was apparently not so great at that time as recently.

A few years ago, Dr. Kempner, of Duke University, instituted the so-called "rice diet" (2000 calories, 20 gm. of protein, 460 gm. of carbohydrates, 5 gm. of fat, 0.2 gm. of sodium and 0.15 gm. of chloride) in cases of nephritis and renal insufficiency. In the course of this study it was observed that the previously high blood pressure not infrequently fell to or toward normal figures. This led to the institution, three or four years ago, of the same diet for the treatment of hypertension per se. The success in some cases in relieving symptoms, in lowering the blood pressure and in the decrease or actual clearing up of evidence of serious hypertensive effects on heart and eyegrounds led to its adoption by Kemp-

ner[5, 6] more or less routinely in the treatment of hypertension. Slowly, knowledge of this therapy has spread from Durham, and the rice diet is being tried in other places, but with no extensive knowledge yet regarding the percentage of favorable results or the persistence of such favorable results over a prolonged period in the course of follow-up study. The percentage of favorable results in a series of 500 patients has just been calculated for a "seminar" to appear in the *American Journal of Medicine*. A lowering of the blood pressure was found in 181 (66 per cent) of the 271 patients with hypertensive vascular disease without evidence of renal excretory dysfunction (1 of the 90 so-called "negative patients" died), and in 129 (56 per cent) of the 229 patients with hypertensive vascular disease with renal involvement (25 of the 100 "negative patients" died after an average period of thirty-nine days).

The rice diet, based on rice itself largely because of its economy, availability and easily assimilated protein, also contains fruits and sugar, but no vegetables, meat, milk or salt. The first course of treatment consists of a strict diet, usually for four to twelve weeks, after which there is the addition of a potato or two a week and a small amount of meat. Very slowly, the diet is liberalized with the substitution of one third of vegetables for one third of the fruit and, finally, with the addition of more meat, but a full routine diet is not, as a rule, resumed. If symptoms recur or if the blood pressure rises, the original diet is started again. No adequate comparison has been made between the effects of the rice diet and those of Smithwick's lumbodorsal sympathectomy, which has proved its success in a certain percentage of hypertensive patients. Both therapeutic measures are radical and, it is hoped, may be replaced some day by simpler therapy.

Some investigators have believed that the benefit of the rice diet may be ascribed to its low sodium content, but as yet this theory has not been proved. The renewed interest in the therapy of hypertension by low-salt intake in the last few years has stimulated such dietary treatment in a number of different centers in the United States and Canada. It is still too early to determine what the ultimate results may be. Various degrees of sodium restriction are involved, and various types of diets, with or without additional therapy, are being tried.

It should be possible after careful studies during the next two or three years to learn what diet or diets may be useful in hypertension and how they work — whether by restriction of sodium, protein and fat, including cholesterol,[7] by combination of such restrictions or for other reasons. It is necessary by detailed studies and by careful follow-up to work out careful answers to the questions that have been propounded.

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MADAME PRESIDENT

Boston claims with pride the distinction of being the birthplace and family home of the first woman president of the American Public Health Association, Dr. Martha May Eliot, who assumed that office on October 9, 1947.

Dr. Eliot is a member of a family that has consistently made its contribution to the public welfare. Her grandfather, William Greenleaf Eliot, founded Washington University in St. Louis; her father, Dr. Christopher R. Eliot was a clergyman of Dorchester. Her brother, the Reverend Dr. Frederick May Eliot of Cambridge is president of the American Unitarian Association; her sister, Dr. Abigail Adams Eliot is director of the Nursery Training School of Boston. The late Charles W. Eliot, former president of Harvard University, was a second cousin of the Reverend Dr. Christopher R. Eliot; Charles W. Eliot's son, the Reverend Dr. Samuel Eliot, preceded Dr. Frederick M. Eliot as president of the American Unitarian Association. Certainly public service has become a heritage and a tradition in the Eliot family!

Dr. Eliot was born in Dorchester on April 7, 1891. She attended the Winsor School and Radcliffe College, from which she graduated in 1913. During the

year after leaving college she worked in the Social Service Department of the Massachusetts General Hospital, in the Children's Cardiac Clinic. In 1918 she received her degree in medicine from Johns Hopkins University School of Medicine after which she interned at the Peter Bent Brigham Hospital.

She became in 1921 the first woman resident physician at the New Haven Hospital, with a teaching position at Yale University School of Medicine. In these early years she made a noteworthy study on rickets for the United States Children's Bureau, and she shortly became a member of the bureau's staff. In 1934 she became assistant chief of the bureau, and in 1941 associate chief. In that year she was sent by the United States Government on a military mission to England to study the impact of war on children under conditions of bombing and evacuation. During the summer of 1947 she was on the staff of the International Children's Emergency Fund Committee of the United Nations, in which capacity she made two trips to eastern Europe, penetrating even the "iron curtain" in the interest of the children of those countries. She is particularly well known as the author of the Emergency Maternal and Infant Care program.

Dr. Eliot has stood firmly for governmental support of health services for all the people—one of the controversial subjects of the day. Whichever side of the argument her professional colleagues may favor, they must respect her opinions and honor her achievements. She has earned her positions on the health councils of the land.

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

REPATRIATION OF WORLD WAR II DECEASED

The Department of Public Health has informed local boards of health regarding the plans and regulations of shipment of World War II deceased.

Upon arrival of the remains in the local community where they are to be buried, the next of kin will arrange with the proper authorities for the issuance of the burial permit. The local board of health of the community wherein burial is to be made will issue a burial permit covering the remains of the World War II dead to any licensed funeral director in the state upon presentation of the decedent's name, rank and serial number, which is stenciled on the end of the outside shipping case, and the basic health permit number as indicated on the basic health permit marker, which is attached to the end of the shipping case. No Massachusetts Standard Certificate of Death Form R–301 need be filed except for persons who died in the service abroad since the end of hostilities. In such cases a complete death certificate will be returned with the transit permit.

In filling out the burial permit, the phrase "World War II Deceased" will be entered under the cause of death.

Additional routine information as required should be requested of the funeral director, such as residence of next of kin and plan of interment.

The following rule was adopted by the Board of Registration in Embalming and Funeral Directing at its meeting held on September 26, 1947:

> Rule 46–A — No casket, box or other container in which a body that has been disinterred and shipped to this country from foreign soil, shall be opened before burial of such body in the Commonwealth.

The outside shipping case is not included in the above rule.

CANCER INSTITUTE

A cancer institute will be held in Boston from November 16 to 21, inclusive, under the joint sponsorship of the Massachusetts Department of Public Health, Harvard School of Public Health, American Cancer Society (Massachusetts Division, Incorporated), Massachusetts Medical Society (Committee on Cancer), Massachusetts Dental Society and Boston Health League.

A public meeting, sponsored by the Harvard School of Public Health, will be held in the amphitheater of Building E, Harvard Medical School, at 3:30 p.m. on Sunday, November 16. A conference for state-aided cancer-clinic workers and a meeting for medical social workers, nurses and similar personnel will be held at the Red Cross Chapter House, 17 Gloucester Street, from 10:30 a.m. to 4:00 p.m. on Monday, November 17. A clinic for members of the Massachusetts Dental Society will be conducted at the Palmer Memorial Hospital, 195 Pilgrim Road, at 2:00 p.m., with a luncheon meeting of cancer-control committees at Vanderbilt Hall, Harvard Medical School, at 1:30 p.m. on Tuesday, November 18. On Wednesday, November 19, from 10:00 a.m. to 4:30 p.m., a meeting for state-aided cancer-clinic staffs will be held in Amphitheater 3A of the White Building, Massachusetts General Hospital. The American Cancer Society (Massachusetts Division, Incorporated) will present a radio program on Thursday, November 20. A meeting of medical social workers, nurses and similar personnel will be held in the auditorium at 100 Nashua Street from 10:15 a.m. to 4:00 p.m. on Friday, November 21.

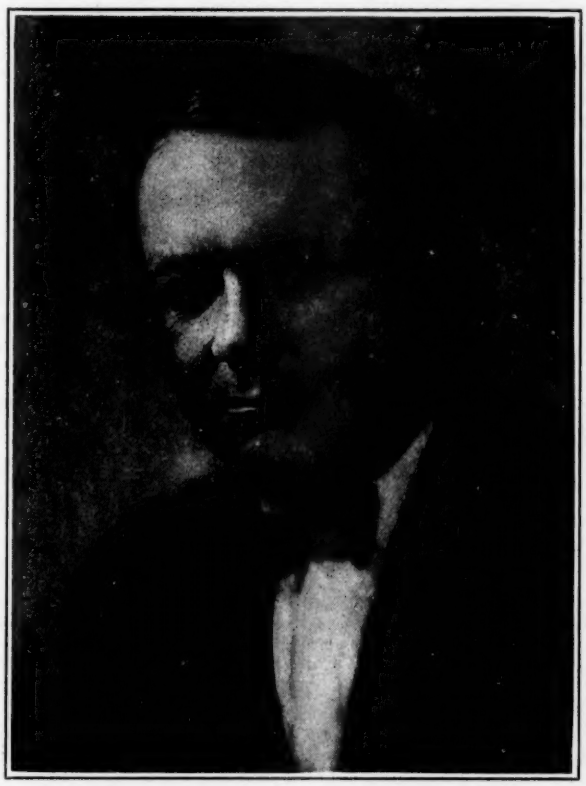
ROBERT N. NYE MEMORIAL FUND

The American Cancer Society, Incorporated (Massachusetts Division), announces that the Robert N. Nye Memorial Fund is in excess of $2245.

ROBERT NASON NYE

(1892–1947)

Robert Nason Nye was born in Springfield, Massachusetts, on June 3, 1892, the son of George Nye, Jr., and Mabel Francis (Nason) Nye. Entering Harvard College in the fall of 1910 he qualified for his degree *cum laude* in 1913. He spent the following year at the Harvard Medical School and then went into business. He returned a year later, received his degree *cum laude* in February, 1918, and enrolled in the Medical Reserve Corps, although he was never called to active duty; after a few months in the Pathology Laboratory of the Boston City Hospital, he served a medical internship at the Massachusetts General Hospital. He subsequently worked for a year in the Medical Research Laboratory of the Hospital, returning in 1920 to the Boston City Hospital as assistant pathologist. In 1922 he was appointed assistant director of the Antitoxin and Vaccine Laboratory of the Massachusetts Department of Public Health, resigning to become assistant physician to the new Thorndike Memorial Laboratory at the Boston City Hospital. He became associate physician to the Laboratory in 1929. He had been assistant professor of bacteriology and immunology at the Harvard Medical School since 1942.



Meanwhile, in 1937, he had turned his talents in a new direction, succeeding the late Dr. Walter P. Bowers as managing editor of the *New England Journal of Medicine*. The capable leadership that he brought to the *Journal* has been largely responsible for its continued progress and the maintenance of its high standards.

He became a member of the Committee on Information, Division of Medical Sciences of the National Research Council in 1940, and during the war was a member of the Committee on Information of the Procurement and Assignment Service of the War Manpower Commission.

Dr. Nye was an editor of *War Medicine*, recently published by the American Medical Association, a councilor of the Massachusetts Medical Society, a trustee and treasurer of the Boston Medical Library, a councilor of the Harvard Medical Alumni Association and director at large of the Massachusetts Tuberculosis Association. He was a member of the American Society for Clinical Investigation, the American Association of Pathologists and Bacteriologists, the American Association of Immunologists, the American Academy for the Advancement of Science and the Society of Experimental Biology and Medicine.

In 1917 he married Katherine Blake Lincoln, of Springfield, who survives him with their two children, Mrs. William Caldwell Coleman, Jr., of Baltimore, and George Nye, and two grandchildren, William Caldwell Coleman, III, and Robert Nason Nye, II.

Here are his achievements and his record — the record of one who did well that to which he set himself. In work or in play he did not put his hand to a task or his mind to a problem without mastering it. Whether in keeping bees or in luring a salmon or in turning from the exacting science of bacteriology to the exacting duty of editing and managing a leading journal of medicine, he did the thing in hand superlatively well.

We shall remember him for his varied contributions to the changing pattern of medical science and literature and sociology; we shall remember him with deeper feeling as an ardent lover of life with a peculiar sensitiveness to the muted strings of nature — among his garden flowers or looking for the first hepatica bloom on his wooded island, or stopping on the trail to identify a warbler that had dallied in its northern flight or casting a fly over a ripple on the lake he loved so well. The goal of life was in the living of it.

Knowing that Nature never did betray
The heart that loved her; 'tis her privilege,
Through all the years of this our life, to lead
From joy to joy. . . .

MISCELLANY

PRIZE SUBSCRIPTION

The prize subscription offered by the *New England Journal of Medicine* for the best undergraduate contribution to the *Tufts Medical Journal* has been awarded to William H. Waugh for his paper "The Sites and Mechanism of Plasma Globulin Formation," which appeared in the June, 1947, issue. The paper "Some Achievements of the Public Health Laboratory" by Miriam Manning received honorable mention; it appeared in the December, 1946, issue. According to custom, these students will be given a two-year and a one-year subscription to the *Journal*, respectively.

NOTES

Dr. Robert E. Gross, surgeon-in-chief of the Children's Hospital, Boston, and William E. Ladd Professor of Child Surgery, Harvard Medical School, was awarded the Matas Medal at New Orleans on October 3, 1947.

In 1933, under the will of Violet Hart, a fund was established for the purpose of awarding a medal from time to time to a surgeon who had contributed to the advance of surgery of the blood vessels. It is named in honor of Dr. Rudolph Matas, of New Orleans, a pioneer surgeon in this field. Since 1933 there have been four awards: to Dr. Mont Reid, of Cincinnati, Dr. DeSantos, of Portugal, Dr. Daniel Elkin, of Atlanta, and, in 1947, to Dr. Gross.

The medical profession of Boston takes pride in this tangible recognition of the abilities of one of its fellow members.

Dr. Kendall Emerson, managing director of the National Tuberculosis Association since 1928, has announced his resignation, effective January 1, 1948. He will be succeeded by Dr. James E. Perkins, deputy commissioner, Department of Health, State of New York.

BOOK REVIEWS

Anesthesia in General Practice. By Stuart C. Cullen, M.D. 8°, cloth, 260 pp., with 36 illustrations and 4 tables. Chicago: The Year Book Publishers, Inc., 1946. $3.50.

This book represents a necessary step in the development of literature on anesthesiology. It is a good textbook for students, and as such fills a pressing need. The discussion of anesthetic agents, methods of administration, drugs, preoperative medication and postoperative care of the patient is not exhaustive but is clearly and concisely outlined. The chapters on shock, oxygen therapy and explosion hazards are treated in their proper relation to the practice of anesthesiology. The cartoons presented seem somewhat juvenile at first glance. Actually, they are effective in focusing the attention of the student on important principles of diagnosis and treatment of drug reaction and oxygen lack. This book is a straightforward presentation of basic facts in the practice of anesthesiology.

Personality of the Preschool Child: The child's search for his self. By Werner Wolff, 8°, cloth, 341 pp., with 118 illustrations. New York: Grune and Stratton, 1946. $5.00.

This excellent book is based on the idea that, although detailed studies of the child's overt behavior are available, an attempt should be made to study "the hidden forces and motivations" of such behavior. The task was to design experiments to explore the spontaneous verbal, graphic and dramatic expressions of children and thus to gain a unifying concept. The approach is called "experimental depth psychology." The author thinks that the young child's action can be interpreted as a continuous search for his self. It is a fundamental fact that the child's world is different from that of the adult and that the child cannot be understood in any terms taken from adult psychology. The young child lacks all the experience of an adult, who fills in continuously the gaps in his own experience by pieces of knowledge that he has acquired from his surroundings. The preschool child, with little or no knowledge and facing constantly new experiences, has not yet an understanding of the value of the various items he encounters. The child is therefore forced to overbridge the gaps by imaginary interpretations drawn from fantasy rather than from experience.

The book is divided into three parts. The first discusses several aspects of the child's mind, conditions and social activities and his concept of reality. The second attempts a construction of the child's personality through the reflection of his various activities and reactions. In this section, play and drawings are freely used for the exploration of the preschool child's world. The only criticism that could be attached to this otherwise interesting study is that the author relies in his interpretations too much on the expressions of the child himself or on his own interpretation of what he thinks the child meant. The third section discusses the principle of children's art, as well as the child and the adult and methods in child psychology.

By virtue of the fact that the author emphasizes in the beginning the differences between the adult's and the child's world, some of the interpretations appear not too convincing, and the author draws too heavily on other sources of experience like psychoanalysis to achieve the goal of a unifying interpretation of the child's personality — a knowledge that the author's own material cannot provide in every direction.

The book, although written primarily for psychologists and not psychiatrists, contains a great wealth of material, and will prove of benefit to any pediatrician or psychiatrist.

The Principles and Practice of Medicine: Originally written by William Osler, M.D., F.R.C.P. Designed for the use of practitioners and students of medicine. By Henry A. Christian, M.D., LL.D., (Hon.) Sc.D., Hon.F.R.C.P. (Can.). Sixteenth edition. 8° cloth, 1539 pp. New York: D. Appleton–Century Company, Inc. 1947. $10.00.

Dr. Osler published his monumental textbook in 1892 and was solely responsible for the first seven editions. In 1916 Dr. Thomas McCrae became a joint author, and in 1919 after Dr. Osler's death he carried the work through the twelfth edition, published in 1935. Dr. Christian assumed the authorship with the thirteenth edition in 1938 and has continued to revise the succeeding editions. He inaugurated an innovation by appending lists of selected references to each subject and thus enabling the reader to follow up any given subject. These references include the literature of 1945.

The new edition has been thoroughly revised to bring it up to date, resulting in the complete resetting of more than nine hundred pages.

The book has had a remarkable publishing history. At least eighty-four separate printings have been issued simultaneously in America and England through the fifteenth edition. In recent years the publishers have indicated the printings by a numeral found at the end of the index. Unfortunately, in the sixteenth edition the system has reverted to number one, indicating the first printing of this edition. The binding has been varied. The first four editions were issued in four styles, two in leather and two in full cloth, and in four different colors. Editions five to seven were bound in brown half leather and full red cloth. With the thirty-seventh printing of the eighth edition the binding was standardized in one style of full red cloth that has been continued to date. The first printing of the first edition is identified by the date of the advertising pages, the misprinting of "Gorgias" as "Georgias" in the quotation from Plato and the lettering on the backstrip (the edition number was not printed on the backstrip of editions one to seven). The first English printing appeared both with and without the Plato error. The fourth English edition was pirated, resulting in two issues by Pentland and by Kimpton. The work has been translated into three Chinese editions, as well as into French, German, Spanish and, in 1945, Portuguese.

The Boston Medical Library has a unique collection of editions of this textbook, originally begun by Dr. Henry R. Viets and continued by the Library. It numbers to date one hundred different printings in the various bindings of the American edition, as well as the English editions, all the translations and the first American and English printings. Dr. James C. Carr has prefixed to the sixteenth edition a short history of medicine (1892–1947) as told in the sixteen editions.

The popularity of the book is attested by its numerous printings over a period of fifty-five years and the fact that the

publishers are making an initial printing of this 1947 edition larger than that of any of their popular texts for the last twenty-five years. The material is well organized and emphasizes symptomatology, diagnosis and treatment. The printing is well done with a good type on light paper, resulting in a comparatively light volume for the number of pages. A remarkable comprehensive index of 147 pages concludes the book. It is hoped that with the seventeenth edition wider margins will be restored to the pages.

The book is an ideal reference text for the busy practitioner and should be in all medical libraries.

The Ranks of Death: A medical history of the conquest of America. By P. M. Ashburn, M.D. Edited by Frank D. Ashburn. 8°, cloth, 298 pp. New York: Coward-McCann, Inc., 1947. $5.00.

The manuscript of this posthumous volume, by the well known author of *The Elements of Military Hygiene* and *A History of the Medical Department of the United States Army*, was found among his papers and prepared for publication with an appropriate preface by his son. It presents a medical history of the conquest of America, particularly the part played on both sides by disease, including famine, scurvy, smallpox, typhus, measles, malaria, yellow fever, tuberculosis, pneumonia, diphtheria, dysentery, typhoid fever and syphilis. In general, these auxiliaries inflicted more casualties on the aborigines than on the invaders, whose resistance and intelligence were superior. In his epilogue, the author suggests that the race can "best keep well by acquiring immunity."

This is an exceedingly valuable volume, not only in itself but also as a source for future students and writers. A large amount of technical material allied with the text is collected in three appendixes, where it is easily available for reference.

Studies and Essays in the History of Science and Learning Offered in Homage to George Sarton on the Occasion of his Sixtieth Birthday, 31 August 1944. Edited by M. F. Ashley Montagu, Ph.D. 8°, cloth, 596 pp., with illustrations and portrait. New York: Henry Schuman, 1947. $12.00.

George Sarton, the distinguished professor of the History of Science at Harvard University and author of an indispensable tool for workers in the field of science and medicine, his *Introduction to the History of Science*, attained his sixtieth birthday on August 31, 1944. The present volume, whose publication was much delayed by the war, was presented to him by his friends in manuscript form on that occasion. The contents reflect the wide basis on which the history of science rests, for among the twenty-seven essays written in homage to Sarton the following topics are given consideration: Vesalius on bloodletting; DaVinci as a military engineer; sex-linked heredity; positivism; ethiocogenesis; Galileo's Platonism; transfinite numbers; Babylonian astronomy; Chinese grammar; maps of the Missouri River; and public bureaucracy and a biography of George Green, the physicist. The interest of everyone with scientific curiosity should be stirred by one or more of the scholarly and informative papers in this exceptionally pleasing volume. Not the least important is the all-too-brief biographical sketch of the modest master of the subject, which lets in a little more light on his complexed career, transplanted in April, 1915, from a war-torn Belgium to what at first was a cold and unappreciative America. Slowly his outstanding rank in history and science was appreciated, and in 1940, among many other honors, Harvard made him a full professor.

The volume is well edited and well printed. An excellent portrait of Sarton serves as a frontispiece. The publisher has shown great taste in the format. The only drawback is the price, made necessary by the times and in spite of "benefactors," which may well serve to keep the book out of deserving hands.

The Self You Have to Live With. By Winfred Rhoades. Revised edition. 8°, cloth, 254 pp. Philadelphia: J. B. Lippincott Co., 1947. $2.00.

The author of this book assisted Dr. Joseph H. Pratt in building up the Thought Control Clinic of the Boston Dispensary. For years he has worked with patients referred to that clinic by doctors in various parts of New England, during which time he has witnessed and helped the development of group psychotherapy in a unique way.

This book is one of the fundamental chapters from his experience. It contains common-sense points of view and ideas that he has used in dealing with patients who have expressed a wish to help themselves by psychologic means. It is not so much a profound as it is a practical book. The ideas are an interesting rephrasing of old truths in a form that is handy for clinical use, rather than new discoveries. The volume belongs with books that are valuable as a form of self-help, and as such can be considered a contribution to bibliotherapy.

BOOKS RECEIVED

The receipt of the following books is acknowledged, and this listing must be regarded as a sufficient return for the courtesy of the sender. Books that appear to be of particular interest will be reviewed as space permits. Additional information in regard to all listed books will be gladly furnished on request.

Office Immunology, including Allergy: A guide for the practitioner. Edited by Marion B. Sulzberger, M.D., professor of clinical dermatology and syphilology and director, New York Skin and Cancer Unit, New York Post-Graduate Medical School and Hospital; and Rudolf L. Baer, M.D., instructor in dermatology and syphilology, New York Skin and Cancer Unit, New York Post-Graduate Medical School and Hospital. 8°, cloth, 420 pp. Chicago: Year Book Publishers, Incorporated, 1947. $6.50.

This volume, the joint work of six physicians, is published as one of the *General Practice Manuals*. It is principally concerned with the infectious diseases and dermatologic and other allergies. Emphasis is placed on diagnosis, treatment and preventive inoculation. Drug eruption, eczematous contact-type allergic dermatitis and patch testing are fully discussed. The manual is written for the practicing physician and endeavors to assemble in one volume the essential material now scattered through many volumes.

Medical Aspects of Growing Old. By A. T. Todd, M.B. (Edin.), M.R.C.P. (Lond.), honorary physician, Bristol Royal Infirmary. 8°, cloth, 164 pp., with 13 illustrations. Bristol: John Wright and Sons, Ltd., 1946.

This manual, which has been written for the laity as well as for physicians, has been kept as simple as possible. The first part treats of mentality, physiology of the digestive tract and diet, retirement and the use of leisure time, exercise and sleep. These chapters are followed by a discussion of conditions met with in the aged, constipation, cardiovascular disturbances, blood pressure, emphysema and genitourinary troubles in both men and women. There are also chapters on the care of the nose, skin, hair and feet. The material is well organized and well written. The publishing is excellent. The advice given is sensible, and the manual should prove valuable to those interested in the medical care of the aged.

Year Book of Endocrinology, Metabolism and Nutrition for 1946. Endocrinology, edited by Willard O. Thompson, M.D., clinical professor of medicine, University of Illinois College of Medicine, attending physician (Senior Staff), Henrotin Hospital, and attending physician, Grant Hospital of Chicago. *Metabolism and Nutrition*, edited by Tom D. Spies, M.M., associate professor of medicine, University of Cincinnati School of Medicine, and director, Nutrition Clinic, Hillman Hospital, Birmingham, Alabama. 12°, cloth, 573 pp., with 85 illustrations. Chicago: Year Book Publishers, Incorporated, 1947. $3.75.

For twelve years the subject of endocrinology has been published as a part of the *Year Book of Neurology, Psychiatry and Endocrinology*. For 1946 it appears as a new year book associated with metabolism and nutrition. The volume comprises abstracts of important articles printed in English in various periodicals for 1946. Indexes of subjects and authors conclude the volume, which is well published in every way. It should prove useful to persons interested in the subjects discussed and desiring to keep abreast of the current literature.

Microbial Antagonisms and Antibiotic Substances. By Selman A. Waksman, M.S., D.Sc., Ph.D., professor of microbiology, Rutgers University, and microbiologist, New Jersey Agricultural Experiment Station. Revised edition. 8°, cloth, 415 pp., with 33 figures. New York: The Commonwealth Fund, 1947. $4.00.

Since the completion of the text of the first edition of this book in 1945, great advances have been made in the field of antibiotics. Penicillin and streptomycin have become important chemotherapeutic agents. The text has been thoroughly revised to bring the subject up to date, and much new material has been added. The bibliography comprising 1053 citations has been revised by the omission of many of the historical items contained in the first edition and by the addition of references to the literature to 1946. The book should be in all medical libraries and in the libraries of all persons interested in the subject.

NOTICES

Dr. Robert F. Dine announces the opening of an office for the practice of orthopedic surgery at 483 Beacon Street, Boston, and for the practice of bone and joint surgery at 741 Main Street, Waltham.

Dr. Nathan Louis announces the removal of his office to 171 Bay State Road, Boston.

Dr. James W. Sever announces the removal of his office to 330 Dartmouth Street, Boston.

Dr. Richard C. Webster announces the removal of his office for the practice of plastic and reconstructive surgery to 1101 Beacon Street, Brookline.

JOSEPH H. PRATT DIAGNOSTIC HOSPITAL

Bennet Street, Boston
Lecture Hall, 9–10 a.m.

MEDICAL CONFERENCE PROGRAM

Friday, November 14 — Prolonging the Action of Penicillin. Dr. Albert O. Seeler.
Wednesday, November 19 — Glycogen Storage Disease. Dr. Richard Wagner.
Friday, November 21 — The Evaluation of Drugs for the Relief of Bronchial Asthma. Dr. Maurice S. Segal.
Wednesday, November 26 — The Discovery of Insulin. Dr. Joseph H. Pratt.
Friday, November 28 — Studies of Certain Metabolic Disturbances Carried Out with the Aid of Isotopes. Dr. DeWitt Stetten.

On Tuesday and Thursday mornings from 9:00 to 10:00 Dr. S. J. Thannhauser will give medical clinics on hospital cases. On Friday afternoons from 2:00 to 4:00 therapeutic conferences will be held with round-table discussion, Dr. R. P. McCombs, Moderator. On the second and fourth Friday afternoons of each month, Dr. Merrill Sosman will conduct x-ray conferences from 4:00 to 6:00. On Saturday mornngs from 9:00 to 10:00, clinics will be given by Dr. William Dameshek. Medical rounds are conducted each weekday except Saturday by members of the Staff from 12:00 to 1:00.

All exercises are open to the medical profession.

GREATER BOSTON MEDICAL SOCIETY

A meeting of the Greater Boston Medical Society will be held in the auditorium of the Beth Israel Hospital on Tuesday, November 18, at 8:15 p.m. A symposium on cancer will be presented, with Dr. Joseph C. Aub as chairman.

PROGRAM

The Use of the Nitrogen Mustards and Urethane in the Treatment of Neoplastic Disease. Dr. David A. Karnofsky.
Studies in the Chemotherapy of Cancer. Dr. Arnold Seligman.
Endocrine Therapy of Carcinoma of the Breast. Dr. Ira T. Nathanson.
Stilbamidine in the Therapy of Multiple Myeloma. Dr. Bernard Jacobson.

SOUTH END MEDICAL CLUB

The next regular meeting of the South End Medical Club will be held at the headquarters of the Boston Tuberculosis Association, 554 Columbus Avenue, Boston, on Tuesday, November 18, at 12 noon. Dr. Charles P. Emerson will speak on "Leukemias and Lymphomas."

Physicians are cordially invited to attend.

CUTTER LECTURE

The Cutter Lecture on Preventive Medicine, initiated in 1912, will be given by Dr. Haven Emerson, Emeritus Professor of Public Health Practice, Columbia University School of Public Health, on Monday, November 24, at 5 p.m., in the Amphitheater of Building D of the Harvard Medical School. His subject will be "Whither the Pegasus of Public Health?"

The medical profession, medical and public-health students and others interested are cordially invited to attend.

RADIOLOGICAL SOCIETY OF NORTH AMERICA

The thirty-third annual meeting of the Radiological Society of North America will be held at the Hotel Statler, Boston, from November 30 to December 5, inclusive. Symposiums on the economics of medicine, pediatric roentgenology and radioactive iodine will be held on various days of the meeting, and numerous papers concerning the latest advances in x-ray diagnosis and treatment will be presented by members of the society. Dr. Douglas Quick, of New York City, will deliver the Carman Lecture at 8 p.m. on Tuesday, December 2.

More than 800 members of the society are expected to attend the meeting. The scientific program and exhibits give promise of being of great interest. The "refresher courses" will be given as usual. The commercial exhibits will embrace all the recent and projected developments in diagnostic and therapeutic apparatus. An interesting ladies' program has been planned.

NEW ENGLAND HEART ASSOCIATION

The next meeting of the New England Heart Association will be held at the Massachusetts General Hospital on Monday, December 1, at 8:15 p.m. Dr. Paul D. White will preside.

PROGRAM

Announcements by the president, Dr. Howard B. Sprague.
The Treatment of Intractable Paroxysmal Tachycardia by Sympathetic Block. Drs. Edward F. Bland and J. C. White.
Coronary Arteriovenous Aneurysm: A rare anomaly. Drs. Oglesby Paul, Richard H. Sweet and Paul D. White.
A Case of Rheumatic Heart Disease with Periodic Arterial Embolism: Ambulatory treatment with dicumarol. Dr. Howard B. Sprague and Robert P. Jacobsen, Ph.D.
Neurocirculatory Asthenia. Drs. Mandel E. Cohen, Edwin O. Wheeler and Paul D. White.
Phonocardiography and Electrokymography. Drs. Howard B. Sprague and Bertrand Wells.
Unipolar Limb Leads. Dr. Conger Williams.

Interested physicians and medical students are cordially invited to attend.

SUFFOLK DISTRICT MEDICAL SOCIETY

A stated meeting of the Suffolk District Medical Society will be held at the Boston Medical Library on Tuesday, December 9, at 4:30 p.m.

(*Notices continued on page xvii*)